

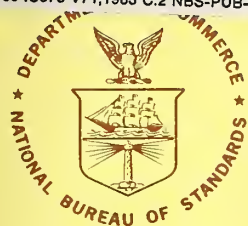
A11101 577759

NATL INST OF STANDARDS & TECH R.I.C.



A11101577759

Levin, Rhoda D/Ionization potential and
QC100 .U573 V71:1983 C.2 NBS-PUB-C 1982



NSRDS-NBS 71

U.S. DEPARTMENT OF COMMERCE / National Bureau of Standards



Ionization Potential and Appearance Potential Measurements, 1971-1981

QC

100

.U573

No.71

1983

C.2

NATIONAL BUREAU OF STANDARDS

The National Bureau of Standards¹ was established by an act of Congress on March 3, 1901. The Bureau's overall goal is to strengthen and advance the Nation's science and technology and facilitate their effective application for public benefit. To this end, the Bureau conducts research and provides: (1) a basis for the Nation's physical measurement system, (2) scientific and technological services for industry and government, (3) a technical basis for equity in trade, and (4) technical services to promote public safety. The Bureau's technical work is performed by the National Measurement Laboratory, the National Engineering Laboratory, and the Institute for Computer Sciences and Technology.

THE NATIONAL MEASUREMENT LABORATORY provides the national system of physical and chemical and materials measurement; coordinates the system with measurement systems of other nations and furnishes essential services leading to accurate and uniform physical and chemical measurement throughout the Nation's scientific community, industry, and commerce; conducts materials research leading to improved methods of measurement, standards, and data on the properties of materials needed by industry, commerce, educational institutions, and Government; provides advisory and research services to other Government agencies; develops, produces, and distributes Standard Reference Materials; and provides calibration services. The Laboratory consists of the following centers:

Absolute Physical Quantities² — Radiation Research — Chemical Physics —
Analytical Chemistry — Materials Science

THE NATIONAL ENGINEERING LABORATORY provides technology and technical services to the public and private sectors to address national needs and to solve national problems; conducts research in engineering and applied science in support of these efforts; builds and maintains competence in the necessary disciplines required to carry out this research and technical service; develops engineering data and measurement capabilities; provides engineering measurement traceability services; develops test methods and proposes engineering standards and code changes; develops and proposes new engineering practices; and develops and improves mechanisms to transfer results of its research to the ultimate user. The Laboratory consists of the following centers:

Applied Mathematics — Electronics and Electrical Engineering² — Manufacturing Engineering — Building Technology — Fire Research — Chemical Engineering²

THE INSTITUTE FOR COMPUTER SCIENCES AND TECHNOLOGY conducts research and provides scientific and technical services to aid Federal agencies in the selection, acquisition, application, and use of computer technology to improve effectiveness and economy in Government operations in accordance with Public Law 89-306 (40 U.S.C. 759), relevant Executive Orders, and other directives; carries out this mission by managing the Federal Information Processing Standards Program, developing Federal ADP standards guidelines, and managing Federal participation in ADP voluntary standardization activities; provides scientific and technological advisory services and assistance to Federal agencies; and provides the technical foundation for computer-related policies of the Federal Government. The Institute consists of the following centers:

Programming Science and Technology — Computer Systems Engineering.

¹Headquarters and Laboratories at Gaithersburg, MD, unless otherwise noted; mailing address Washington, DC 20234.

²Some divisions within the center are located at Boulder, CO 80303.

NSRDS-NBS

Ionization Potential and Appearance Potential Measurements, 1971-1981

Rhoda D. Levin and Sharon G. Lias

Ion Kinetics and Energetics Data Center
National Measurement Laboratory
National Bureau of Standards
Washington, DC 20234

NATIONAL BUREAU
OF STANDARDS
LIBRARY

JUL 22 1983

notacc-circ.
QC 100
U573
no. 71
1983
c.2



U.S. DEPARTMENT OF COMMERCE, Malcolm Baldrige, Secretary
NATIONAL BUREAU OF STANDARDS, Ernest Ambler, Director

Issued October 1982

Library of Congress Cataloging in Publication Data

Levin, Rhoda D.
Ionization potential and appearance potential measurements,
1971-1981.

(NSRDS-NBS ; 71)

"Issued October 1982"

1. Ionization.	I. Lias, Sharon G., 1935-	II. Title.	III. Series
QC100.U573 no. 71 [QD561]	602'.18s		82-2095
	[541.3'722]		AACR2

NSRDS-NBS 71

Natl. Stand. Ref. Data Ser., Natl. Bur. Stand. (U.S.), 71, 634 pages (Oct. 1982)
CODEN: NSRDAP

© 1982 by the Secretary of Commerce on Behalf of the United States Government

Supersedes NSRDS-NBS 66, Part 1

U.S. GOVERNMENT PRINTING OFFICE
WASHINGTON: 1982

For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402
Price **\$12.00**
(Add 25 percent for other than U.S. mailing).

In Memoriam

HENRY M. ROSENSTOCK

Dr. Henry Meyer Rosenstock died on September 14, 1982, while this volume was in press. In 1963 Dr. Rosenstock originated the compilation of ionization and appearance potential data at the National Bureau of Standards. Although in 1979 he turned the project over to the present authors in order to devote more time to other scientific interests, he remained throughout the production of this book a wise mentor, a guide to the mysteries of both mass spectrometric literature and data compilation, and, always, a good friend. We gratefully dedicate this work to his memory.

Foreword

The National Standard Reference Data System provides access to the quantitative data of physical science, critically evaluated and compiled for convenience and readily accessible through a variety of distribution channels. The System was established in 1963 by action of the President's Office of Science and Technology and the Federal Council for Science and Technology, and responsibility to administer it was assigned to the National Bureau of Standards.

NSRDS receives advice and planning assistance from a Review Committee of the National Research Council of the National Academy of Sciences-National Academy of Engineering. A number of Advisory Panels, each concerned with a single technical area, meet regularly to examine major portions of the program, assign relative priorities, and identify specific key problems in need of further attention. For selected specific topics, the Advisory Panels sponsor subpanels which make detailed studies of users' needs, the present state of knowledge, and existing data resources as a basis for recommending one or more data compilation activities. This assembly of advisory services contributes greatly to the guidance of NSRDS activities.

The System now includes a complex of data centers and other activities in academic institutions and other laboratories. Components of the NSRDS produce compilations of critically evaluated data, reviews of the state of quantitative knowledge in specialized areas, and computations of useful functions derived from standard reference data. The centers and projects also establish criteria for evaluation and compilation of data and recommend improvements in experimental techniques. They are normally associated with research in the relevant field.

The technical scope of NSRDS is indicated by the categories of projects active or being planned: nuclear properties, atomic and molecular properties, solid state properties, thermodynamic and transport properties, chemical kinetics, and colloid and surface properties.

Reliable data on the properties of matter and materials are a major foundation of scientific and technical progress. Such important activities as basic scientific research, industrial quality control, development of new materials for building and other technologies, measuring and correcting environmental pollution depend on quality reference data. In NSRDS, the Bureau's responsibility to support American science, industry, and commerce is vitally fulfilled.

A handwritten signature in dark ink, reading "E. Ambler." The signature is fluid and cursive, with a large initial "E" and a trailing flourish.

ERNEST AMBLER, *Director*

Contents

	Page
Introduction	1
Literature Coverage	1
Description of the Compilation	2
Acknowledgments	3
References	3
Index of Ions	4
Table of Ion Energetics Measurements	42
Author Index	556
Bibliography	575

Ionization Potential and Appearance Potential Measurements, 1971-1981

Rhoda D. Levin and Sharon G. Lias

Ion Kinetics and Energetics Data Center, National Measurement Laboratory, National Bureau of Standards, Washington, DC 20234

A compilation is presented of the ionization potential and appearance potential measurements which appeared in the refereed literature in the time period 1971-1981. The data are sorted according to the identity of the ionic species formed in the ionization process. Precursor molecules or radicals are identified by a structural formula and, in the case of compounds containing rings, by name according to the Chemical Abstracts system of nomenclature. Chemical Abstracts Registry Numbers are provided where available. A complete bibliography and author index are provided.

Key words: appearance potential; charge transfer spectrum; electron impact ionization; ionization potential; photoelectron spectroscopy; photoionization; spectroscopy.

Introduction

In 1969, the NBS Ion Energetics Data Center, under the direction of Dr. Henry M. Rosenstock, published a compilation of ionization potential and appearance potential measurements covering the literature through mid-1967 [1]¹. This was followed in 1977 by an update covering the literature through 1971 [2]. Both these volumes contained, wherever possible, critical evaluations of the data in which the ionization threshold measurements were paired with thermochemical data on corresponding neutral species to generate values for the heats of formation of ions in the gas phase. The current publication, which consists of a listing of ionization and appearance potential measurements which appeared in the literature between 1971 and 1981 (plus a few older measurements not included in the earlier volumes), is the first step toward a new update.

The 1977 compilation [2] is 10 years out of date at this writing, and the collection given here contains data from approximately 2000 papers which have appeared in the intervening years. The early publication of this encyclopedic list of measurements without an accompanying evaluation serves several purposes. Especially for that body of users whose interest lies in the ionization potentials themselves, or for those who require a bibliographic guide to mass spectrometric and photoelectron spectroscopic measurements, the present volume as it is will serve the need. For those users whose primary interest is in evaluated heats of formation of ions, this volume will best be used as an adjunct to the 1977 compilation, to call attention to newer measurements, until the appearance of an updated critical evaluation.

Data listed in the compilation "Ion Energetics Measurements, 1971-1973" by H. M. Rosenstock, D. Sims, S. S. Shroyer, and W. J. Webb [3] have been included as an integral part of the present book.

This compilation is restricted to processes involving positive ion formation. Data concerned with the energetics of negative ions are being compiled by Dr. John Bartmess of Indiana University, to be published separately in the *Journal of Physical and Chemical Reference Data*. That publication will list the heats of formation and, where available, entropies of negative ions, along with the electron affinities of corresponding neutral species and, where available, the acidities of the corresponding conjugate acids.

Literature Coverage

The literature for the period 1971-1981 was covered initially by an issue-by-issue search of the following journals: *Canadian Journal of Chemistry*, *Canadian Journal of Physics*, *Chemical Communications*, *Chemical Physics*, *Chemical Physics Letters*, *Chemische Berichte*, *Faraday Transactions II*, *Helvetica Chimica Acta*, *High Temperature*, *International Journal of Mass Spectrometry and Ion Physics*, *Journal of the American Chemical Society*, *Journal of Chemical Physics*, *Journal of Electron Spectroscopy and Related Phenomena*, *Journal of Inorganic and Nuclear Chemistry*, *Journal of the Optical Society of America*, *Journal of Organometallic Chemistry*, *Journal of Physical Chemistry*, *Organic Mass Spectrometry*, *Tetrahedron*, and *Tetrahedron Letters*. This search was supplemented by a systematic use of standard abstracting services such as *Chemical Abstracts* and the *Mass Spectrometry Bulletin* (of the *Mass Spectrometry Data Centre*, The University of Nottingham, U.K.). Papers listed

¹ Figures in brackets indicate literature references.

in review articles describing relevant measurements were also checked against the bibliography as a monitor of the completeness of coverage. With the exception of certain journals published in the Soviet Union to which we did not have ready access, the literature coverage is estimated to be better than 95% complete. Only data appearing in refereed journals are included. The cut-off date is approximately March 1981.

Description of the Compilation

The table of ionization and appearance potential measurements follows a format similar to that used in the earlier volumes [1,2,3]. That is, one will find data for a particular system listed under the empirical formula for the ion that is generated in the ionization process of interest. For example, in order to find the ionization potential of acetone, one finds the empirical formula of the acetone ion, $\text{C}_3\text{H}_6\text{O}^+$ (boldface), then identifies those measurements involving acetone precursor molecules by looking in the first column of the table. For the appearance potential of a fragmentation process of the acetone ion (e.g., $\text{CH}_3\text{COCH}_3 \rightarrow \text{CH}_3\text{CO}^+ + \text{CH}_3 + \text{e}^-$), one would locate the empirical formula of the product ion, $\text{C}_2\text{H}_3\text{O}^+$, and identify those measurements involving acetone precursors in the first column. The neutral precursor species are identified by a semi-structural formula, and for compounds containing rings, the compound name according to the system of nomenclature used by the Chemical Abstracts Services. The Chemical Abstracts Registry Number is given for all compounds, when available. For a very few papers which appeared late in 1980, it was necessary if the data were to be included, to use the nomenclature used by the original authors and to omit the Registry Numbers. In some cases, comments about the experimental observation are also given.

The column of the table, labelled "Other Products," contains an indication of the identity of neutral or negative ion fragment species when these are known (e.g., CH_3 in the fragmentation process: $\text{CH}_3\text{COCH}_3 \rightarrow \text{CH}_3\text{CO}^+ + \text{CH}_3 + \text{e}^-$). When the process described is just the removal of an electron, this column contains two asterisks. A word of caution is in order here—some techniques (particularly photoelectron spectroscopy) measure the energy required to remove an electron from a molecule, but do not identify the resulting ionic species. Certain molecular ions (e.g., $\text{neo-C}_5\text{H}_{12}^+$, CCl_4^+) are formed on a dissociative potential surface, and cannot be said to exist in the gas phase. Therefore, it must be stated that the listing of the empirical formula of a particular ion does not necessarily imply that the ion exists in the gas phase.

The fourth column of the table gives the measured energy required to form the listed ion from the neutral molecule or radical in the second column. All values are given in electron volts. When the original data have been reported in units other than electron volts, conversion to electron volts has been made using the following conversion factors: $1 \text{ eV} = 8065.479 \text{ cm}^{-1} = 96.48456 \text{ kJ mol}^{-1} = 23.06036 \text{ kcal mol}^{-1}$. Error limits, when cited, are those given by the original authors.

Ionization potentials given are adiabatic values unless the designation (V) appears after the value, in which case the vertical ionization potential has been given. Photoelectron spectroscopy papers often report only vertical ionization potentials. Although in many cases, these probably coincide with the adiabatic values, we have followed the policy of labelling such ionization potentials "vertical" unless the original authors specifically report the measurement of an adiabatic ionization potential. Because of the original emphasis of this compilation effort on deriving heats of formation of ions, it was initially assumed that the users of this volume would find only adiabatic values useful, and therefore, vertical values were included only when adiabatic values were not given in a particular paper. This same emphasis, as well as space considerations, has deemed that only the lowest ionization potential be included here, except for monatomic, diatomic, and triatomic species, for which transitions leading to higher electronic states are also included. Users whose interests are in vertical ionization potentials or excited states of polyatomic ions will find this volume useful as a bibliographic guide to the literature of photoelectron spectroscopy.

Where available, the ionization potentials corresponding to the formation of doubly-charged ions have been included. Data for ionization processes leading to ions having three or more positive charges are not included.

The fifth column of the table gives an indication of the experimental technique used in the measurement. The abbreviations are as follows:

Abbreviation	Technique
S	Spectroscopy
PI	Photoionization
PE	Photoelectron Spectroscopy
AUG	Auger Electron Spectroscopy
PEN	Penning Ionization
EI	Electron Impact
CTS	Charge Transfer Spectrum
OTH	Other

For detailed descriptions of these various techniques, the reader is referred to the chapter appearing at the beginning of the 1977 compilation [2].

The final column of the table lists the number of the reference in the bibliography at the end of the table. An author index is also provided.

The index lists the empirical formulas of the ionic species, ordered according to an alphabetical sorting scheme. The empirical formulas are written with the atoms given in increasing order of atomic number, with the exception of hydrogen which appears after carbon in carbon-containing ions. The alphabetization is carried out on these formulas as written. For example, the ions CHF_3^+ , CHCl_3^+ , CFCl_3^+ , and CCl_3I^+ would be alphabetized first according to the atom which appears immediately after the C in the empirical formula, then according to the following atom: CCl_3I^+ , CFCl_3^+ , CHCl_3^+ , CHF_3^+ .

As in the earlier volumes [1,2,3], the actual ordering of the ionic species in the compilation is determined by the atom in the molecule which has the highest atomic number, with the overall ordering following the periodic chart in increasing order. To find an ion whose highest atomic number atom is X, find that portion of the compilation devoted to species having X as the highest atomic number atom. In this portion, the sort will first list species containing only X (X^+ , X_2^+ , X_3^+ , etc.), then ions compounded of X and one other element, these other atoms appearing in increasing order of atomic number. Within the set of ions $A_nX_m^+$, all ions with m equal to 1 will appear first while n advances from $n=1$ to the maximum value; then m will be advanced to 2, and so on. When all $A_nX_m^+$ ions (where A has an atomic number lower than that of X) have been listed, $A_nB_pX_m^+$ ions appear (ordering of atomic numbers: $A < B < X$). The indexes are advanced in the order n, p, m . The sort then proceeds to species containing four different atoms, etc.

Acknowledgments

Mrs. Kathy Maugh, Mr. José Portal, and Dr. Pierre Ausloos have all contributed greatly to this work by participating in the abstracting of data from the literature. The authors would also like to acknowledge Dr. Henry M. Rosenstock and the former staff of the NBS Ion Energetics Data Center for the development of the computer processing

procedures used in the production of this book, and the technical assistance of Mr. Robert Thompson, Mrs. Carla Messina, and Mr. George Dines in using those techniques. We would particularly like to thank Ms. Carol Martin for her careful proofreading of the final tables, and Mr. David Stier for writing programs which simplified the final editing process and improved the format of the book. This project was supported by the Office of Standard Reference Data of the National Bureau of Standards and the U.S. Department of Energy Pollutant Characterization and Safety Research Division. That portion of the compilation originally published in reference [3] was supported in part by the National Institute of General Medical Sciences, National Institutes of Health (NIGMS). The advice and encouragement of Dr. L. H. Gevantman is gratefully acknowledged.

References

- [1] Franklin, J. L., Dillard, J. G., Rosenstock, H. M., Herron, J. T., Draxl, K., and Field, F. H., "Ionization Potentials, Appearance Potentials, and Heats of Formation of Gaseous Positive Ions," Nat. Stand. Ref. Data Ser., Nat. Bur. Stand. (U.S.), 26 (1969).
- [2] Rosenstock, H. M., Draxl, K., Steiner, B. W., and Herron, J. T., "Energetics of Gaseous Ions," J. Phys. Chem. Ref. Data **6**, Suppl. 1 (1977).
- [3] Rosenstock, H. M., Sims, D., Shroyer, S. S., and Webb, W. J., "Ion Energetics Measurements. Part I. 1971-1973," Nat. Stand. Ref. Data Ser., Nat. Bur. Stand. (U.S.), 66 (1980).
- [4] Bartmess, J. E., to be published.

Index of Ions

Ac ⁺	552	BC ₃ H ₉ O ⁺	224
Ag ⁺	492	BC ₃ H ₉ O ₂ ⁺	224
AgEu ⁺	527	BC ₃ H ₉ O ₃ ⁺	224
AgHo ⁺	529	BC ₃ H ₉ S ⁺	342
AgI ⁺	518	BC ₃ H ₉ S ₂ ⁺	342
AgI ₃ ⁺	518	BC ₃ H ₉ S ₄ ⁺	342
Ag ₂ ⁺	493	BC ₃ H ₁₂ N ⁺	167
Ag ₂ I ⁺	518	BC ₃ H ₁₁ N ₂ ⁺	168
Ag ₃ ⁺	493	BC ₃ H ₁₂ N ⁺	167
Ag ₃ I ₂ ⁺	518	BC ₃ H ₁₂ N ₂ Br ⁺	470
Ag ₃ I ₃ ⁺	518	BC ₃ H ₁₂ N ₂ Cl ⁺	381
Al ⁺	290	BC ₃ H ₁₂ N ₂ F ⁺	283
AlAg ⁺	493	BC ₃ H ₁₂ N ₂ I ⁺	512
AlAu ⁺	544	BC ₃ H ₁₃ N ₂ ⁺	168
AlAu ₂ ⁺	545	BC ₃ H ₇ NBr ⁺	469
AlBr ⁺	475	BC ₅ H ₇ NCl ⁺	381
AlBr ₃ ⁺	475	BC ₅ H ₇ N ₂ O ₂ ⁺	268
AlCl ⁺	393	BC ₅ H ₈ N ⁺	168
AlCl ₃ ⁺	393	BC ₅ H ₁₅ N ₂ ⁺	168
AlCl ₄ Cs ⁺	521	BC ₆ H ₅ Cl ₂ ⁺	377
AlCl ₄ K ⁺	405	BC ₆ H ₅ F ₂ ⁺	278
AlCl ₄ Rb ⁺	482	BC ₆ H ₇ NF ₃ ⁺	283
AlI ⁺	514	BC ₆ H ₁₀ N ⁺	168
AlI ₃ ⁺	514	BC ₆ H ₁₀ NO ⁺	267
AlSi ⁺	309	BC ₆ H ₁₂ N ⁺	168
Al ₂ ⁺	291	BC ₆ H ₁₂ NO ₃ ⁺	268
Al ₂ ²⁺	291	BC ₆ H ₁₄ N ₃ ⁺	169
Al ₂ Au ⁺	545	BC ₆ H ₁₈ N ₃ ⁺	169
Al ₂ Br ₆ ⁺	475	BC ₈ H ₁₁ O ₂ ⁺	224
Al ₂ Cl ₅ ⁺	393	BC ₈ H ₁₇ N ₂ ⁺	168
Am ⁺	555	BC ₈ H ₁₉ N ₂ ⁺	168
Ar ⁺	402	BC ₉ H ₁₁ N ₂ ⁺	168
Ar ²⁺	403	BC ₉ H ₁₃ N ₂ ⁺	168
ArKr ⁺	482	BC ₉ H ₁₆ N ⁺	168
ArXe ⁺	520	BC ₁₀ H ₁₃ N ₂ ⁺	168
Ar ₂ ⁺	403	BC ₁₀ H ₁₅ N ₂ ⁺	169
As ⁺	454	BC ₁₀ H ₂₀ N ⁺	168
AsBr ⁺	481	BC ₁₁ H ₁₃ Co ⁺	437
AsBr ₂ ⁺	481	BC ₁₂ H ₁₀ ⁺	122
AsBr ₃ ⁺	481	BC ₁₂ H ₁₈ SBr ⁺	478
AsI ₃ ⁺	517	BC ₁₂ H ₁₈ SCl ⁺	400
AsTl ⁺	549	BC ₁₂ H ₁₉ S ⁺	342
As ₂ ⁺	454	BC ₁₃ H ₂₁ OS ⁺	360
As ₄ ⁺	454	BC ₁₃ H ₂₁ S ⁺	342
Au ⁺	544	BC ₁₄ H ₁₉ ⁺	122
AuEu ⁺	545	BC ₁₆ H ₁₅ Co ⁺	437
Au ₂ ⁺	544	BC ₁₆ H ₂₈ N ⁺	168
Au ₂ Eu ⁺	545	BC ₁₈ H ₁₅ ⁺	122
B ⁺	43	BC ₁₈ H ₂₅ U ⁺	554
BAu ⁺	544	BC ₂₁ H ₁₅ F ₃ ⁺	278
BCH ₃ Br ₂ ⁺	467	BCl ⁺	371
BCH ₃ Cl ₂ ⁺	377	BCl ₂ ⁺	371
BCH ₃ F ₂ ⁺	278	BCl ₃ ⁺	371
BCH ₃ O ⁺	224	BF ⁺	269
BCH ₈ N ⁺	167	BFCl ⁺	389
BC ₂ H ₆ Br ⁺	467	BFCl ₂ ⁺	389
BC ₂ H ₆ Cl ⁺	377	BF ₂ ⁺	269
BC ₂ H ₆ F ⁺	278	BF ₂ Cl ⁺	389
BC ₂ H ₇ I ⁺	511	BF ₃ ⁺	269
BC ₂ H ₆ NBr ₂ ⁺	470	BO ⁺	172
BC ₂ H ₆ NCl ₂ ⁺	381	BOAu ⁺	544
BC ₂ H ₆ NF ₂ ⁺	283	BOF ⁺	283
BC ₂ H ₆ NI ₂ ⁺	512	BOF ₂ ⁺	284
BC ₂ H ₈ N ⁺	167	BO ₂ ⁺	172
BC ₂ H ₉ N ⁺	167	BO ₂ Ba ⁺	521
BC ₂ H ₉ NF ₂ P ⁺	323	BO ₂ In ⁺	496
BC ₃ H ₉ ⁺	122	BO ₂ K ⁺	404

BO_2K_2^+	404	$\text{B}_4\text{C}_2\text{H}_{14}\text{NF}_2\text{P}^+$	324
BO_2Na^+	290	$\text{B}_4\text{C}_3\text{H}_8\text{O}_3\text{Fe}^+$	432
BO_2Na_2^+	290	B_5CH^+	121
BO_2Ti^+	548	$\text{B}_5\text{CH}_{11}^+$	121
BO_2Ti_2^+	548	$\text{B}_5\text{C}_2\text{H}_7^+$	121
BO_4W^+	533	$\text{B}_5\text{C}_3\text{H}_3\text{O}_3\text{Fe}^+$	432
BO_5W_2^+	534	$\text{B}_5\text{C}_5\text{H}_3\text{O}_3\text{Fe}^+$	433
$\text{BO}_{10}\text{W}_3^+$	534	$\text{B}_8\text{C}_2\text{H}_{10}^+$	122
$\text{BO}_{13}\text{W}_4^+$	534	$\text{B}_9\text{CH}_{11}\text{S}^+$	342
BP^+	310	$\text{B}_{10}\text{C}_2\text{H}_{12}^+$	122
BSCl^+	399	Ba^+	521
$\text{B}_2\text{C}_2\text{H}_6\text{S}_3^+$	342	Ba^{+2}	521
$\text{B}_2\text{C}_2\text{H}_7\text{NS}_2^+$	350	BaI^+	522
$\text{B}_2\text{C}_3\text{H}_9\text{NOS}^+$	364	Be^+	43
$\text{B}_2\text{C}_3\text{H}_9\text{NS}_2^+$	351	$\text{BeC}_5\text{H}_2\text{Br}^+$	467
$\text{B}_2\text{C}_3\text{H}_9\text{N}_3\text{Br}_2^+$	470	$\text{BeC}_5\text{H}_3\text{Cl}^+$	377
$\text{B}_2\text{C}_3\text{H}_9\text{N}_3\text{Cl}_2^+$	381	BeC_6H_5^+	121
$\text{B}_2\text{C}_3\text{H}_{10}\text{N}_2\text{S}^+$	350	BeC_6H_6^+	121
$\text{B}_2\text{C}_3\text{H}_{11}\text{N}_3^+$	169	BeC_7H_6^+	121
$\text{B}_2\text{C}_4\text{H}_{12}\text{N}_2\text{Br}_2^+$	470	BeC_8H_8^+	121
$\text{B}_2\text{C}_4\text{H}_{12}\text{N}_2\text{Cl}_2^+$	381	$\text{BeC}_{10}\text{H}_2\text{O}_4\text{F}_{12}^+$	287
$\text{B}_2\text{C}_4\text{H}_{12}\text{N}_2\text{F}_2^+$	283	$\text{BeC}_{10}\text{H}_{10}^+$	121
$\text{B}_2\text{C}_4\text{H}_{12}\text{N}_2\text{O}^+$	267	$\text{BeC}_{10}\text{H}_{14}\text{O}_4^+$	224
$\text{B}_2\text{C}_4\text{H}_{12}\text{N}_2\text{S}^+$	350	$\text{BeC}_{12}\text{H}_{10}^+$	121
$\text{B}_2\text{C}_4\text{H}_{12}\text{N}_4\text{Cl}_2^+$	381	BeCl_2^+	371
$\text{B}_2\text{C}_4\text{H}_{13}\text{N}_3^+$	169	BeF^+	269
$\text{B}_2\text{C}_5\text{H}_{15}\text{N}_3^+$	169	BeFCl^+	389
$\text{B}_2\text{C}_5\text{H}_{15}\text{N}_3\text{O}_2^+$	268	BeF_2^+	269
$\text{B}_2\text{C}_5\text{H}_{15}\text{N}_3\text{S}_2^+$	351	Bi^+	551
$\text{B}_2\text{C}_5\text{H}_{16}\text{N}_2\text{SiS}^+$	368	Bi_2^+	551
$\text{B}_2\text{C}_6\text{H}_{18}\text{N}_2^+$	168	Bi_3^+	551
$\text{B}_2\text{C}_6\text{H}_{18}\text{N}_3\text{As}^+$	455	Bi_4^+	551
$\text{B}_2\text{C}_6\text{H}_{18}\text{N}_6\text{P}^+$	316	Bk^+	555
$\text{B}_2\text{C}_6\text{H}_{18}\text{N}_4^+$	169	Br^+	462
$\text{B}_2\text{C}_6\text{H}_{18}\text{N}_4\text{O}_2^+$	268	BrAg^+	494
$\text{B}_2\text{C}_6\text{H}_{18}\text{N}_6\text{S}_2^+$	351	BrAg_3^+	494
$\text{B}_2\text{C}_7\text{H}_{21}\text{N}_3\text{Si}^+$	304	BrBa^+	522
$\text{B}_2\text{C}_7\text{H}_{21}\text{N}_3\text{Sn}^+$	500	BrCs^+	521
$\text{B}_2\text{C}_7\text{H}_{21}\text{N}_5^+$	169	BrI^+	517
$\text{B}_2\text{C}_8\text{H}_{24}\text{N}_3^+$	169	BrIn^+	496
$\text{B}_2\text{C}_8\text{H}_{24}\text{N}_4^+$	169	BrRb^+	483
$\text{B}_2\text{C}_8\text{H}_{24}\text{N}_6\text{P}^+$	316	BrRb_2^+	483
$\text{B}_2\text{C}_8\text{H}_{24}\text{N}_6^+$	170	BrSr^+	483
$\text{B}_2\text{C}_{12}\text{H}_{16}\text{Co}^+$	437	BrTi^+	549
$\text{B}_2\text{C}_{12}\text{H}_{16}\text{O}_2\text{Co}^+$	439	BrW^+	539
$\text{B}_2\text{C}_{22}\text{H}_{20}\text{Co}^+$	437	BrYb^+	530
B_2Cl_4^+	371	Br_2^+	463
B_2F^+	269	Br_2Ag_3^+	494
$\text{B}_2\text{O}_6\text{W}^+$	534	Br_2Cd^+	495
$\text{B}_2\text{O}_{12}\text{W}_3^+$	534	Br_2Nd^+	526
$\text{B}_3\text{C}_2\text{H}_5^+$	121	Br_2Pb^+	551
$\text{B}_3\text{C}_2\text{H}_{11}\text{NF}_2\text{P}^+$	323	Br_2Sn^+	503
$\text{B}_3\text{C}_2\text{H}_{12}\text{NF}_2\text{P}^+$	323	Br_2Tm^+	530
$\text{B}_3\text{C}_3\text{H}_9\text{N}_3\text{Cl}_3^+$	381	Br_2W^+	539
$\text{B}_3\text{C}_3\text{H}_9\text{N}_3\text{F}_3^+$	283	Br_2Yb^+	530
$\text{B}_3\text{C}_3\text{H}_{12}\text{N}_3^+$	169	Br_3Ag_3^+	494
$\text{B}_3\text{C}_3\text{H}_5\text{O}_3\text{Fe}^+$	433	Br_3In^+	497
$\text{B}_3\text{C}_3\text{H}_5\text{O}_3\text{Fe}^+$	433	Br_3Sb^+	506
$\text{B}_3\text{C}_6\text{H}_{18}\text{N}_3^+$	169	Br_3Tm^+	530
$\text{B}_3\text{C}_6\text{H}_{24}\text{N}_5^+$	169	Br_3W^+	539
$\text{B}_3\text{C}_6\text{H}_7\text{Br}_2^+$	468	Br_3W_2^+	539
$\text{B}_3\text{C}_2\text{H}_4\text{Cl}_2^+$	377	Br_4Hf^+	531
$\text{B}_3\text{C}_2\text{H}_4\text{I}_2^+$	512	Br_4W^+	539
$\text{B}_3\text{C}_2\text{H}_5\text{Br}^+$	467	Br_4W_2^+	539
$\text{B}_3\text{C}_2\text{H}_5\text{Cl}^+$	377	Br_4Zr^+	484
$\text{B}_3\text{C}_2\text{H}_5\text{I}^+$	511	Br_5W^+	539
$\text{B}_3\text{C}_2\text{H}_6^+$	121	Br_5W_2^+	539
$\text{B}_3\text{C}_2\text{H}_8^+$	121	Br_6W_2^+	540
$\text{B}_4\text{C}_2\text{H}_{12}\text{NF}_2\text{P}^+$	323	Br_6Re_3^+	542

C ⁺	44	CH ₂ Cl ⁺	372
C ⁺²	44	CH ₂ Cl ₂ ⁺	375
CBr ⁺	463	CH ₂ D ⁺	46
CBr ₃ ⁺	463	CH ₂ DSi ⁺	293
CBr ₄ ⁺	464	CH ₂ D ₂ Si ⁺	293
CCl ⁺	371	CH ₂ F ⁺	274
CCl ₂ ⁺	371	CH ₂ FCl ⁺	391
CCl ₂ Br ₂ ⁺	479	CH ₂ F ₃ As ⁺	456
CCl ₃ ⁺	371	CH ₂ F ₃ P ⁺	321
CDN ⁺	125	CH ₂ F ₄ S ⁺	366
CDO ⁺	174	CH ₂ I ⁺	509
CD ₂ ⁺	45	CH ₂ I ₂ ⁺	511
CD ₂ O ⁺	174	CH ₂ N ⁺	125
CD ₃ ⁺	46	CH ₂ NF ⁺	281
CD ₃ NO ₂ ⁺	246	CH ₂ NF ₂ ⁺	282
CD ₃ O ⁺	175	CH ₂ NO ⁺	226
CD ₄ O ⁺	175	CH ₂ NS ⁺	343
CF ⁺	269	CH ₂ N ₂ ⁺	146
CFBr ₃ ⁺	474	CH ₂ N ₃ ⁺	164
CFCl ⁺	389	CH ₂ O ⁺	174
CFCl ₂ ⁺	390	CH ₂ OAs ⁺	455
CFCl ₃ ⁺	390	CH ₂ OS ⁺	352
CFP ⁺	321	CH ₂ O ₂ ⁺	204
CFSCI ⁺	401	CH ₂ PCl ₃ ⁺	397
CF ₂ ⁺	270	CH ₂ PS ⁺	368
CF ₂ Br ₂ ⁺	473	CH ₂ S ⁺	329
CF ₂ Cl ⁺	389	CH ₂ S ₂ ⁺	337
CF ₂ ClBr ⁺	479	CH ₃ ⁺	45
CF ₂ Cl ₂ ⁺	390	CH ₃ AlBr ₂ ⁺	476
CF ₂ PCl ₃ ⁺	399	CH ₃ AlI ₂ ⁺	514
CF ₂ S ⁺	365	CH ₃ Br ⁺	464
CF ₃ ⁺	271	CH ₃ Cl ⁺	372
CF ₃ Br ⁺	473	CH ₃ Cl ₂ Ge ⁺	453
CF ₃ Cl ⁺	390	CH ₃ Cl ₃ Ge ⁺	453
CF ₃ I ⁺	514	CH ₃ Cl ₃ Ti ⁺	407
CF ₃ IHg ⁺	548	CH ₃ D ⁺	46
CF ₃ PCl ₂ ⁺	398	CH ₃ DO ⁺	175
CF ₄ ⁺	271	CH ₃ DSi ⁺	293
CH ⁺	44	CH ₃ D ₂ Si ⁺	294
CHBr ⁺	464	CH ₃ F ₂ P ⁺	321
CHBr ₂ ⁺	466	CH ₃ F ₂ Si ⁺	308
CHBr ₃ ⁺	467	CH ₃ F ₃ Si ⁺	308
CHCl ₂ ⁺	375	CH ₃ Ga ⁺	447
CHCl ₃ ⁺	376	CH ₃ I ⁺	509
CHD ⁺	45	CH ₃ N ⁺	126
CHDO ⁺	174	CH ₃ NBr ₂ ⁺	469
CHD ₂ ⁺	46	CH ₃ NCl ₂ ⁺	381
CHD ₂ O ⁺	175	CH ₃ NF ₄ P ₃ ⁺	323
CHD ₃ ⁺	46	CH ₃ NO ⁺	226
CHD ₃ O ⁺	175	CH ₃ NOGe ⁺	451
CHF ⁺	274	CH ₃ NOSi ⁺	306
CHFCl ₂ ⁺	392	CH ₃ NO ₂ ⁺	246
CHF ₂ ⁺	276	CH ₃ NS ⁺	343
CHF ₂ Cl ⁺	391	CH ₃ NSGe ⁺	453
CHF ₃ ⁺	277	CH ₃ NSiS ⁺	368
CHI ₂ ⁺	511	CH ₃ N ₂ ⁺	146
CHI ₃ ⁺	511	CH ₃ N ₃ ⁺	162
CHN ⁺	125	CH ₃ O ⁺	175
CHNF ₂ ⁺	282	CH ₃ OAs ⁺	455
CHNO ⁺	226	CH ₃ OPCl ₂ ⁺	397
CHNS ⁺	343	CH ₃ OPSCl ₂ ⁺	402
CHO ⁺	174	CH ₃ OS ⁺	352
CHOF ⁺	284	CH ₃ O ₂ ⁺	204
CHOM _n ⁺	422	CH ₃ O ₂ FS ⁺	367
CHO ₂ ⁺	204	CH ₃ O ₂ F ₂ P ⁺	324
CHP ⁺	310	CH ₃ O ₂ PBr ₂ ⁺	477
CHS ⁺	328	CH ₃ O ₂ PCl ₂ ⁺	398
CH ₂ ⁺	44	CH ₃ O ₂ SCI ⁺	401
CH ₂ Br ⁺	464	CH ₃ PCl ₂ ⁺	396
CH ₂ Br ₂ ⁺	466	CH ₃ PCl ₂ Se ⁺	462

CH ₃ PSBr ₂ ⁺	479	COF ₄ ⁺	284
CH ₃ PSCl ₂ ⁺	402	COF ₆ SiP ₂ Cl ₃ Co ⁺	441
CH ₃ S ⁺	329	COF ₁₂ P ₄ Fe ⁺	434
CH ₃ Si ⁺	293	COFe ⁺	430
CH ₃ ⁺	46	COMn ⁺	422
CH ₄ N ⁺	126	COMo ⁺	486
CH ₄ NBr ⁺	468	CONi ⁺	443
CH ₄ NCl ⁺	378	COS ⁺	352
CH ₄ N ₂ ⁺	146	COSe ⁺	460
CH ₄ N ₂ O ⁺	240	COSiCl ₃ Co ⁺	441
CH ₄ N ₂ S ⁺	346	COW ⁺	534
CH ₄ O ⁺	175	CO ₃ K ₂ ⁺	404
CH ₄ OAs ⁺	455	CP ⁺	310
CH ₄ OP ⁺	317	CPCl ₅ ⁺	396
CH ₄ OS ⁺	352	CP ₂ ⁺	310
CH ₄ O ²⁺	175	CRh ⁺	491
CH ₄ O ₂ P ⁺	317	CRhCe ⁺	524
CH ₄ O ₃ P ⁺	318	CRuCe ⁺	524
CH ₄ S ⁺	329	CS ⁺	327
CH ₄ S ₂ ⁺	337	CSCI ₂ ⁺	399
CH ₄ Si ⁺	293	CSCr ⁺	418
CH ₄ SiCl ₂ ⁺	395	CSFe ⁺	434
CH ₅ N ⁺	126	CSFe ₂ ⁺	434
CH ₅ NO ⁺	227	CSMn ⁺	425
CH ₅ O ₂ P ⁺	318	CSMnI ⁺	516
CH ₅ P ⁺	310	CSMo ⁺	489
CH ₅ Si ⁺	293	CSSe ⁺	461
CH ₆ N ₂ ⁺	146	CSW ⁺	538
CH ₆ OSi ⁺	305	CS ₂ ⁺	328
CH ₆ Si ⁺	294	CSe ⁺	458
CH ₆ SiS ⁺	367	CSe ₂ ⁺	458
CH ₇ NSi ₂ ⁺	304	CSiCe ⁺	524
ClA ⁺	522	CSiP ⁺	325
CN ⁺	124	CSi ₂ ⁺	293
CNEu ⁺	527	CTh ⁺	552
CNF ⁺	279	CU ⁺	554
CNFP ⁺	322	C ₂ ⁺	44
CNF ₂ P ⁺	322	C ₂ Al ⁺	291
CNF ₂ PS ⁺	370	C ₂ Al ₂ ⁺	291
CNGa ⁺	448	C ₂ Ce ⁺	523
CNK ⁺	404	C ₂ Cl ₆ ⁺	371
CNK ₂ ⁺	404	C ₂ D ⁺	46
CNOBr ⁺	472	C ₂ D ₂ ⁺	47
CNOBr ₃ ⁺	472	C ₂ D ₃ ⁺	48
CNOCl ⁺	385	C ₂ D ₃ O ⁺	178
CNOClBr ₂ ⁺	479	C ₂ D ₄ ⁺	49
CNOCl ₂ Br ⁺	479	C ₂ D ₄ O ⁺	179
CNOCl ₃ ⁺	385	C ₂ Eu ⁺	527
CNOFCl ₂ ⁺	393	C ₂ FCl ₂ ⁺	390
CNOF ₂ Cl ⁺	393	C ₂ F ₂ ⁺	270
CNOF ₂ P ⁺	324	C ₂ F ₂ Cl ⁺	390
CNOF ₃ ⁺	287	C ₂ F ₂ Cl ₂ ⁺	390
CNOI ⁺	513	C ₂ F ₃ ⁺	271
CNO ₂ ⁺	226	C ₂ F ₃ Br ⁺	473
CNO ₃ F ₃ Hg ⁺	547	C ₂ F ₃ Cl ⁺	390
CNPr ⁺	525	C ₂ F ₃ Cl ₃ ⁺	391
CN ₂ F ₂ ⁺	280	C ₂ F ₃ S ₂ Cl ⁺	401
CN ₃ F ₃ Hg ⁺	547	C ₂ F ₄ ⁺	272
CN ₄ ⁺	125	C ₂ F ₄ Br ₂ ⁺	474
CO ⁺	173	C ₂ F ₄ Cl ₂ ⁺	390
CO ⁺²	173	C ₂ F ₄ I ₂ ⁺	514
COBr ₂ ⁺	470	C ₂ F ₄ S ₂ ⁺	365
COCl ⁺	382	C ₂ F ₅ ⁺	272
COCl ₂ ⁺	382	C ₂ F ₅ Cl ⁺	390
COCo ⁺	438	C ₂ F ₆ I ⁺	514
COCr ⁺	410	C ₂ F ₆ ⁺	272
COF ⁺	284	C ₂ F ₆ PCl ⁺	398
COF ₂ ⁺	284	C ₂ F ₆ S ₂ Hg ⁺	547
COF ₃ SiPCL ₃ Co ⁺	441	C ₂ Fe ⁺	429

C_2H^+	46	$C_2H_3NO^+$	227
C_2HBr^+	464	$C_2H_3NO_3^+$	261
C_2HCl^+	372	$C_2H_3NS^+$	343
$C_2HCl_3^+$	377	$C_2H_3N_3^+$	162
C_2HD^+	47	$C_2H_3N_3O^+$	245
$C_2HD_2^+$	48	$C_2H_3O^+$	176
$C_2HD_3^+$	49	$C_2H_3OBr^+$	470
$C_2HD_3O^+$	179	$C_2H_3OCl^+$	382
C_2HF^+	274	$C_2H_3OF^+$	284
C_2HFCl^+	391	$C_2H_3OF_3^+$	286
$C_2HF_2^+$	276	$C_2H_3OPCl_2^+$	398
$C_2HF_2Cl^+$	391	$C_2H_3O_2^+$	204
$C_2HF_3^+$	277	$C_2H_3O_2Br^+$	471
$C_2HF_3Cl_2^+$	392	$C_2H_3O_2Cl^+$	384
$C_2HF_6P^+$	322	$C_2H_3O_2I^+$	513
C_2HI^+	509	$C_2H_3P^+$	311
C_2HOCl^+	382	$C_2H_3S^+$	329
$C_2HOCl_3^+$	385	$C_2H_4^+$	48
$C_2HO_2F_3^+$	286	$C_2H_4Br^+$	464
$C_2HO_2Mn^+$	422	$C_2H_4Br_2^+$	466
$C_2H_2^+$	47	$C_2H_4Cl^+$	372
$C_2H_2Br_2^+$	466	$C_2H_4ClBr^+$	479
$C_2H_2Cl^+$	372	$C_2H_4Cl_2^+$	375
$C_2H_2Cl_2^+$	375	$C_2H_4DO^+$	179
$C_2H_2Cl_4^+$	377	$C_2H_4F^+$	274
$C_2H_2Co^+$	437	$C_2H_4FBr^+$	474
$C_2H_2D_2^+$	48	$C_2H_4F_2^+$	276
$C_2H_2D_3^+$	49	$C_2H_4Ga^+$	448
$C_2H_2D_3O^+$	179	$C_2H_4I_2^+$	511
$C_2H_2F^+$	274	$C_2H_4N^+$	126
$C_2H_2FBr^+$	474	$C_2H_4NO^+$	227
$C_2H_2FCl^+$	391	$C_2H_4NS^+$	343
$C_2H_2F_2^+$	276	$C_2H_4N_2^+$	146
$C_2H_2F_2Br_2^+$	475	$C_2H_4N_2O_2^+$	254
$C_2H_2F_3I^+$	514	$C_2H_4N_3^+$	164
$C_2H_2I_2^+$	511	$C_2H_4O^+$	178
$C_2H_2N^+$	126	$C_2H_4OAs^+$	455
$C_2H_2NBr^+$	468	$C_2H_4OPCl_3^+$	398
$C_2H_2NCl^+$	378	$C_2H_4OS^+$	352
$C_2H_2NF^+$	281	$C_2H_4O_2^+$	205
$C_2H_2NOCl_3^+$	389	$C_2H_4O_2S^+$	357
$C_2H_2N_2Se^+$	460	$C_2H_4O_3^+$	219
$C_2H_2N_3Br^+$	469	$C_2H_4O_3S^+$	359
$C_2H_2N_3Cl^+$	380	$C_2H_4O_4^+$	222
$C_2H_2N_4^+$	164	$C_2H_4PCl_3^+$	397
$C_2H_2O^+$	175	$C_2H_4PSCl_3^+$	402
$C_2H_2OCl_2^+$	384	$C_2H_5^+$	329
$C_2H_2O_2^+$	204	$C_2H_5S^+$	339
$C_2H_2O_4^+$	222	$C_2H_5Si^+$	294
$C_2H_2S^+$	329	$C_2H_5^+$	49
$C_2H_2S_3^+$	339	$C_2H_5Br^+$	464
$C_2H_2Se^+$	459	$C_2H_5Cl^+$	372
$C_2H_3^+$	47	$C_2H_5F^+$	274
$C_2H_3Br^+$	464	$C_2H_5I^+$	509
$C_2H_3Cl^+$	372	$C_2H_5N^+$	126
$C_2H_3Cl_3^+$	377	$C_2H_5NO^+$	227
$C_2H_3D^+$	48	$C_2H_5NO_2^+$	246
$C_2H_3DO^+$	178	$C_2H_5NS^+$	343
$C_2H_3D_2^+$	49	$C_2H_5O^+$	179
$C_2H_3D_2O^+$	179	$C_2H_5OAs^+$	455
$C_2H_3D_3^+$	49	$C_2H_5OBr^+$	470
$C_2H_3D_3O^+$	180	$C_2H_5OCl^+$	383
$C_2H_3F^+$	274	$C_2H_5OF^+$	284
$C_2H_3F_2^+$	276	$C_2H_5OI^+$	512
$C_2H_3F_2Cl^+$	391	$C_2H_5OPSCl_2^+$	402
$C_2H_3F_3^+$	277	$C_2H_5OSiCl_3^+$	395
$C_2H_3Ga^+$	447	$C_2H_5O_2^+$	205
$C_2H_3I^+$	509	$C_2H_5O_2As^+$	455
$C_2H_3N^+$	126	$C_2H_5O_2PCl_2^+$	398
$C_2H_3NF^+$	281	$C_2H_5P^+$	311

$C_2H_5PCl_2^+$	396	$C_2H_7OCl^+$	383
$C_2H_5S^+$	330	$C_2H_7OP^+$	317
$C_2H_5SCl^+$	399	$C_2H_7OPS_2^+$	369
$C_2H_5Se^+$	459	$C_2H_7O_2As^+$	455
$C_2H_6^+$	49	$C_2H_7O_2PS^+$	369
$C_2H_6AlBr^+$	476	$C_2H_7O_3P^+$	318
$C_2H_6AlCl^+$	393	$C_2H_7P^+$	311
$C_2H_6AlI^+$	514	$C_2H_7PS^+$	369
$C_2H_6Cd^+$	495	$C_2H_7Si^+$	294
$C_2H_6ClGe^+$	453	$C_2H_8Ge^+$	449
$C_2H_6ClSn^+$	503	$C_2H_8N_2^+$	146
$C_2H_6Cl_2Ge^+$	453	$C_2H_8N_2O_2P^+$	320
$C_2H_6Cl_2Sn^+$	503	$C_2H_8N_2S^+$	346
$C_2H_6FP^+$	321	$C_2H_8Si^+$	294
$C_2H_6FSi^+$	308	$C_2H_9NSi^+$	303
$C_2H_6F_2Ge^+$	452	$C_2H_{10}N_3OP^+$	319
$C_2H_6F_2Si^+$	308	C_3La^+	522
$C_2H_6F_3SiAs^+$	456	C_3Lu^+	531
$C_2H_6Ga^+$	448	$C_2NOF_3Hg^+$	547
$C_2H_6Hg^+$	546	$C_3NOF_6^+$	287
$C_2H_6N^+$	126	$C_3N_2^+$	125
$C_2H_6NBr^+$	468	$C_3N_2^{2+}$	124
$C_2H_6NCl^+$	378	$C_3N_2F_6^+$	280
$C_2H_6NF_2^+$	282	$C_3N_2K_4^+$	404
$C_2H_6NF_2P^+$	322	$C_3N_2O^+$	226
$C_2H_6NF_3Si^+$	309	$C_3N_2O_2Fe^+$	433
$C_2H_6NF_3P^+$	323	$C_3N_2S^+$	343
$C_2H_6NOPCl_2^+$	398	$C_3N_2S_2^+$	343
$C_2H_6NPCL_2^+$	397	$C_3OCl_4^+$	382
$C_2H_6NPSCl_2^+$	402	$C_3OCl_3^+$	382
$C_2H_6NSiCl_3^+$	395	$C_3OCl_4^+$	382
$C_2H_6N_2^+$	146	C_3OF^+	284
$C_2H_6N_2O^+$	240	C_3OFe^+	430
$C_2H_6N_2O_2^+$	254	C_3OSCr^+	418
$C_2H_6N_2P_2F_6^+$	323	C_3OSMo^+	489
$C_2H_6N_2S_2^+$	350	C_3OSW^+	538
$C_2H_6O^+$	179	$C_2O_2Br_2^+$	470
$C_2H_6OAs^+$	455	$C_2O_2Cl_2^+$	382
$C_2H_6OPCl^+$	397	$C_2O_2Co^+$	438
$C_2H_6OPS^+$	369	$C_2O_2Cr^+$	411
$C_2H_6OPS_2^+$	369	$C_2O_2F^+$	284
$C_2H_6OS^+$	352	$C_2O_2F_6SiP_2Cl_3Co^+$	441
$C_2H_6O_2^+$	205	$C_2O_2F_9P_3Fe^+$	434
$C_2H_6O_2As^+$	455	$C_2O_2Fe^+$	430
$C_2H_6O_2P^+$	318	$C_2O_2Mn^+$	422
$C_2H_6O_2PS^+$	369	$C_2O_2Mo^+$	486
$C_2H_6O_2PS_2^+$	369	$C_2O_2Ni^+$	443
$C_2H_6O_2S^+$	357	$C_2O_2SiCl_3Co^+$	441
$C_2H_6O_3P^+$	318	$C_2O_2W^+$	534
$C_2H_6O_3PS^+$	369	C_3P^+	310
$C_2H_6O_3S^+$	359	C_3Rh^+	491
$C_2H_6PCl^+$	396	C_3RhCe^+	524
$C_2H_6PClSe^+$	462	C_3RuCe^+	524
$C_2H_6PSBr^+$	479	$C_3S_2Cl_4^+$	399
$C_2H_6PSCl^+$	402	$C_3S_2Fe_2^+$	434
$C_2H_6S^+$	330	$C_3S_2Mn_2^+$	425
$C_2H_6S_2^+$	337	$C_3S_4^+$	328
$C_2H_6Se^+$	459	C_3Sc^+	405
$C_2H_6Si^+$	294	C_3Si^+	293
$C_2H_6SiCl^+$	394	C_3Th^+	552
$C_2H_6SiCl_2^+$	395	C_3Ti^+	406
$C_2H_6SiCl_3As^+$	457	C_3U^+	554
$C_2H_6SiPCL_3^+$	399	C_3Y^+	483
$C_2H_6Si_2^+$	299	C_3Zr^+	483
$C_2H_6Te^+$	506	C_4^+	44
$C_2H_6Zn^+$	446	$C_3D_6^+$	53
$C_2H_7As^+$	454	$C_3D_6O^+$	181
$C_2H_7N^+$	127	C_3F^+	270
$C_2H_7NO^+$	227	$C_3F_2^+$	270
$C_2H_7NOS^+$	360	$C_3F_3^+$	271

$C_3F_3Br^+$	473	$C_3H_4O^+$	180
$C_3F_3Cl^+$	390	$C_3H_4OS_2^+$	360
$C_3F_3I^+$	514	$C_3H_4O_2^+$	205
$C_3F_4^+$	272	$C_3H_4O_2S^+$	357
$C_3F_6^+$	272	$C_3H_4O_3^+$	219
$C_3F_6S^+$	365	$C_3H_4O_4^+$	222
$C_3F_6P^+$	321	$C_3H_4S_3^+$	340
C_3H^+	49	$C_3H_5^+$	51
$C_3HD_3^+$	53	$C_3H_5Br^+$	464
$C_3HD_6^+$	53	$C_3H_5Cl^+$	372
C_3HF^+	274	$C_3H_5ClHg^+$	547
$C_3HF_2^+$	276	$C_3H_5D^+$	53
$C_3HF_3^+$	277	$C_3H_5D_3O^+$	181
C_3HN^+	127	$C_3H_5F^+$	275
$C_3HNF_6^+$	283	$C_3H_5I^+$	509
C_3HO^+	180	$C_3H_5N^+$	128
$C_3HOF_4Cl^+$	393	$C_3H_5NO^+$	227
$C_3HO_3Mn^+$	422	$C_3H_5NOS^+$	360
C_3HS^+	330	$C_3H_5NO_2^+$	247
$C_3H_2^+$	49	$C_3H_5NS^+$	343
$C_3H_2D_6^+$	53	$C_3H_5NS_2^+$	349
$C_3H_2F^+$	274	$C_3H_5N_3O^+$	245
$C_3H_2F_2^+$	276	$C_3H_5O^+$	180
$C_3H_2N^+$	127	$C_3H_5OCl^+$	383
$C_3H_2NCl^+$	378	$C_3H_5OF^+$	284
$C_3H_2NO^+$	227	$C_3H_5OPCl_2^+$	398
$C_3H_2N^{2+}$	128	$C_3H_5OS^+$	353
$C_3H_2N_2^+$	147	$C_3H_5S^+$	330
$C_3H_2N_2O_2S^+$	364	$C_3H_5S_2^+$	337
$C_3H_2N_2O_4^+$	263	$C_3H_6^+$	52
$C_3H_2O^+$	180	$C_3H_6Br^+$	464
$C_3H_2OCO_2^+$	438	$C_3H_6Br_2^+$	466
$C_3H_2OF_3Br^+$	475	$C_3H_6Cl^+$	373
$C_3H_2OF_4^+$	286	$C_3H_6D^+$	53
$C_3H_2OF_6^+$	286	$C_3H_6F^+$	275
$C_3H_2O_2S^+$	357	$C_3H_6FBr^+$	474
$C_3H_2O_3^+$	219	$C_3H_6F_2^+$	277
$C_3H_2S_3^+$	340	$C_3H_6N^+$	128
$C_3H_3^+$	50	$C_3H_6NF^+$	281
$C_3H_3Br^+$	464	$C_3H_6NF_3PCI^+$	399
$C_3H_3Cl^+$	372	$C_3H_6NO^+$	227
$C_3H_3Co^+$	437	$C_3H_6NOCl^+$	385
$C_3H_3D_3^+$	53	$C_3H_6NS^+$	344
$C_3H_3F^+$	274	$C_3H_6NSe^+$	459
$C_3H_3Fe^+$	429	$C_3H_6N_2^+$	147
$C_3H_3I^+$	509	$C_3H_6N_2OF_3P^+$	324
$C_3H_3N^+$	128	$C_3H_6N_2OPCl_3^+$	398
$C_3H_3NO^+$	227	$C_3H_6N_2O_2^+$	255
$C_3H_3NS^+$	343	$C_3H_6N_2O_3^+$	263
$C_3H_3NS_2^+$	349	$C_3H_6N_2S^+$	346
$C_3H_3N_2^+$	147	$C_3H_6O^+$	180
$C_3H_3N_3^+$	162	$C_3H_6OS^+$	353
$C_3H_3Ni^+$	441	$C_3H_6OS_2^+$	360
$C_3H_3O^+$	180	$C_3H_6O_2^+$	205
$C_3H_3OF_3^+$	286	$C_3H_6O_2S^+$	357
$C_3H_3OF_5^+$	286	$C_3H_6O_3^+$	220
$C_3H_3O_2F_3^+$	286	$C_3H_6O_3^+$	220
$C_3H_3Ru^+$	490	$C_3H_6S^+$	330
$C_3H_3W^+$	532	$C_3H_6S_2^+$	337
$C_3H_4^+$	50	$C_3H_6S_3^+$	340
$C_3H_4D_2^+$	53	$C_3H_6SiCl_2^+$	395
$C_3H_4D_3^+$	53	$C_3H_7^+$	53
$C_3H_4D_3O^+$	181	$C_3H_7Br^+$	464
$C_3H_4F^+$	274	$C_3H_7Cl^+$	373
$C_3H_4N^+$	147	$C_3H_7F^+$	275
$C_3H_4N_2O^+$	240	$C_3H_7I^+$	510
$C_3H_4N_2O_2^+$	254	$C_3H_7N^+$	128
$C_3H_4N_2S_2^+$	350	$C_3H_7NO^+$	227
$C_3H_4N_3Br^+$	469	$C_3H_7NO_2^+$	247
$C_3H_4N_3Cl^+$	380	$C_3H_7NO_2S^+$	363

$C_3H_7NS^+$	344
$C_3H_7O^+$	181
$C_3H_7OBr^+$	470
$C_3H_7OCl^+$	383
$C_3H_7OF^+$	284
$C_3H_7OI^+$	512
$C_3H_7O_3P^+$	318
$C_3H_7S^+$	330
$C_3H_7Se^+$	459
$C_3H_8^+$	53
$C_3H_8Hg^+$	546
$C_3H_8N^+$	128
$C_3H_8N_2^+$	147
$C_3H_8N_2O^+$	240
$C_3H_8N_2O_2^+$	255
$C_3H_8N_2S^+$	346
$C_3H_8N_2S_2^+$	350
$C_3H_8O^+$	181
$C_3H_8OS^+$	353
$C_3H_8O_4P^+$	319
$C_3H_8S^+$	330
$C_3H_8S_2^+$	337
$C_3H_8Si^+$	294
$C_3H_9Al^+$	291
$C_3H_9As^+$	454
$C_3H_9BrPb^+$	551
$C_3H_9BrSn^+$	504
$C_3H_9ClGe^+$	453
$C_3H_9ClPb^+$	551
$C_3H_9ClSn^+$	503
$C_3H_9FSi^+$	308
$C_3H_9Ga^+$	448
$C_3H_9Ge^+$	449
$C_3H_9N^+$	128
$C_3H_9NO^+$	228
$C_3H_9N_3F_{12}P_6Cr^+$	418
$C_3H_9N_3F_{12}P_6Mo^+$	489
$C_3H_9N_3F_{12}P_6W^+$	538
$C_3H_9N_3Si^+$	304
$C_3H_9OAs^+$	455
$C_3H_9OP^+$	317
$C_3H_9OSi^+$	305
$C_3H_9O_2PS_2^+$	369
$C_3H_9O_3As^+$	456
$C_3H_9O_3P^+$	318
$C_3H_9O_3PCr^+$	416
$C_3H_9O_3PS^+$	369
$C_3H_9O_3PSe^+$	461
$C_3H_9O_3PW^+$	536
$C_3H_9O_4P^+$	319
$C_3H_9P^+$	311
$C_3H_9PS^+$	369
$C_3H_9Pb^+$	550
$C_3H_9Sb^+$	505
$C_3H_9Si^+$	294
$C_3H_9SiBr^+$	476
$C_3H_9SiCl^+$	394
$C_3H_9SiMn^+$	424
$C_3H_9Sn^+$	497
$C_3H_{10}NP^+$	315
$C_3H_{10}N_2^+$	147
$C_3H_{10}Si^+$	295
$C_3H_{10}Sn^+$	497
$C_3H_{12}N_3OP^+$	319
$C_3H_{16}Ge^+$	449
C_3La^+	522
C_3NBr^+	468
C_3NCl^+	378
C_3NF^+	279

C_3NI^+	512
$C_3NO_4Co^+$	439
$C_3N_2O^+$	226
$C_3N_3F_3^+$	280
$C_3OF_3Cl_3^+$	393
$C_3OF_5^+$	284
$C_3OF_5Cl^+$	393
$C_3OF_6^+$	284
$C_3O_2^+$	174
$C_3O_2Fe^+$	430
$C_3O_2SCr^+$	418
$C_3O_2SMo^+$	489
$C_3O_2SW^+$	538
$C_3O_3Cr^+$	411
$C_3O_3F_3SiPCl_2Co^+$	441
$C_3O_3F_3SiPCl_3Co^+$	441
$C_3O_3F_6P_2Fe^+$	434
$C_3O_3F_9P_3Cr^+$	418
$C_3O_3Fe^+$	430
$C_3O_3Fe^{+2}$	430
$C_3O_3Mn^+$	422
$C_3O_3Mo^+$	486
$C_3O_3Ni^+$	443
$C_3O_3SiCl_3Co^+$	441
$C_3O_3W^+$	534
$C_3S_6^+$	328
C_3Th^+	552
C_3U^+	554
$C_4Br_2^+$	463
$C_4Cl_2^+$	371
$C_4D_4^+$	54
$C_4D_4S^+$	331
$C_4D_7^+$	55
$C_4F_2^+$	270
$C_4F_3^+$	271
$C_4F_4^+$	272
$C_4F_6^+$	272
$C_4F_6Co_2^+$	439
$C_4F_8^+$	273
$C_4F_{12}As_2^+$	456
$C_4F_{12}P_2^+$	321
$C_4F_{12}P_4^+$	321
C_4HBr^+	464
C_4HCl^+	373
C_4HF^+	275
C_4HI^+	510
$C_4HN_2F_3^+$	282
$C_4HO_4Co^+$	438
$C_4HO_4Mn^+$	423
$C_4H_2^+$	53
$C_4H_2D_4^+$	55
$C_4H_2F_3^+$	277
$C_4H_2F_4^+$	278
$C_4H_2N_2^+$	147
$C_4H_2N_2F_2^+$	282
$C_4H_2N_2S^+$	346
$C_4H_2O_2^+$	206
$C_4H_2O_2Cl_2^+$	384
$C_4H_2O_2Co_2^+$	438
$C_4H_2O_3^+$	220
$C_4H_2O_4Fe^+$	432
$C_4H_2SBr_2^+$	478
$C_4H_2SI_2^+$	515
$C_4H_7^+$	54
$C_4H_3BrTe^+$	508
$C_4H_3ClSe^+$	462
$C_4H_3ClTe^+$	508
$C_4H_3I^+$	510
$C_4H_3N^+$	129

$C_4H_4NOS^+$	361	$C_4H_6O^+$	222
$C_4H_3NO_2S^+$	363	$C_4H_6S^+$	331
$C_4H_3NO_2Se^+$	461	$C_4H_6S_3^+$	340
$C_4H_3NO_2^+$	261	$C_4H_6SiCl_2^+$	395
$C_4H_3N_2F^+$	281	$C_4H_7^+$	55
$C_4H_3N_2OBr^+$	472	$C_4H_7Br^+$	465
$C_4H_3N_2OCl^+$	386	$C_4H_7Ge^+$	449
$C_4H_3N_2OF^+$	287	$C_4H_7N^+$	129
$C_4H_3OBr^+$	470	$C_4H_7NO^+$	228
$C_4H_3OClHg^+$	547	$C_4H_7NO_2^+$	247
$C_4H_3O_4CoGe^+$	454	$C_4H_7NO_3^+$	261
$C_4H_3O_4SiCo^+$	440	$C_4H_7NS_2^+$	349
$C_4H_3S^+$	331	$C_4H_7N_3O^+$	245
$C_4H_3SBr^+$	477	$C_4H_7N_3S^+$	348
$C_4H_3SCl^+$	399	$C_4H_7O^+$	182
$C_4H_3SClHg^+$	547	$C_4H_7O_3P^+$	318
$C_4H_3SI^+$	515	$C_4H_7O_4PCl_2^+$	398
$C_4H_3TeI^+$	519	$C_4H_7Si^+$	295
$C_4H_4^+$	54	$C_4H_7Sn^+$	497
$C_4H_4F_3^+$	277	$C_4H_8^+$	55
$C_4H_4N^+$	129	$C_4H_8Br_2^+$	466
$C_4H_4NO_2Br^+$	473	$C_4H_8FBr^+$	474
$C_4H_4NO_2Cl^+$	387	$C_4H_8N^+$	129
$C_4H_4N_2^+$	147	$C_4H_8NO^+$	228
$C_4H_4N_2O^+$	240	$C_4H_8NOCl^+$	385
$C_4H_4N_2O_2^+$	255	$C_4H_8NO_2Se^+$	461
$C_4H_4N_2O_3^+$	263	$C_4H_8N_2^+$	148
$C_4H_4O^+$	181	$C_4H_8N_2O_2^+$	255
$C_4H_4OS^+$	353	$C_4H_8N_2S^+$	346
$C_4H_4O_2^+$	206	$C_4H_8N_4^+$	164
$C_4H_4O_3^+$	220	$C_4H_8O^+$	182
$C_4H_4O_4^+$	222	$C_4H_8OPCl^+$	397
$C_4H_4O_8Mo_2^+$	487	$C_4H_8OS^+$	353
$C_4H_4S^+$	331	$C_4H_8O_2^+$	206
$C_4H_4SSe^+$	461	$C_4H_8O_2S^+$	358
$C_4H_4STe^+$	507	$C_4H_8O_4^+$	222
$C_4H_4S_2^+$	337	$C_4H_8S^+$	331
$C_4H_4S_3^+$	340	$C_4H_8S_2^+$	337
$C_4H_4Se^+$	459	$C_4H_8S_4Sn^+$	502
$C_4H_4Te^+$	506	$C_4H_8Se^+$	459
$C_4H_5^+$	54	$C_4H_8Si^+$	295
$C_4H_5N^+$	129	$C_4H_8Te^+$	506
$C_4H_5NO_2^+$	247	$C_4H_9^+$	56
$C_4H_5NS^+$	344	$C_4H_9As^+$	454
$C_4H_5NS_2^+$	349	$C_4H_9Br^+$	465
$C_4H_5N_2^+$	162	$C_4H_9Cl^+$	373
$C_4H_5N_3O^+$	245	$C_4H_9F_2P^+$	321
$C_4H_5O^+$	182	$C_4H_9I^+$	510
$C_4H_5O_2F^+$	286	$C_4H_9N^+$	129
$C_4H_5O_3Cl^+$	384	$C_4H_9NO^+$	228
$C_4H_6^+$	54	$C_4H_9NOS^+$	361
$C_4H_6Co_2^+$	437	$C_4H_9NOSi^+$	306
$C_4H_6F_2Si^+$	308	$C_4H_9NO_2^+$	247
$C_4H_6F_6P_2^+$	322	$C_4H_9NS^+$	344
$C_4H_6Ga^+$	448	$C_4H_9NS_2^+$	349
$C_4H_6N^+$	129	$C_4H_9NSiS^+$	368
$C_4H_6NF_6P^+$	323	$C_4H_9N_2OF_2P^+$	324
$C_4H_6NOSe^+$	461	$C_4H_9O^+$	183
$C_4H_6N_2^+$	148	$C_4H_9OSiMn^+$	424
$C_4H_6N_2O^+$	241	$C_4H_9O_2As^+$	456
$C_4H_6N_2O_2^+$	255	$C_4H_9O_2PCl_2^+$	398
$C_4H_6N_2S^+$	346	$C_4H_9O_3P^+$	318
$C_4H_6N_2S_2^+$	350	$C_4H_9O_3PCr^+$	416
$C_4H_6N_3Br^+$	469	$C_4H_9O_4PW^+$	536
$C_4H_6N_3Cl^+$	380	$C_4H_9PCl_2^+$	396
$C_4H_6N_4^+$	164	$C_4H_9S^+$	331
$C_4H_6O^+$	182	$C_4H_9Si^+$	295
$C_4H_6O_2^+$	206	$C_4H_9SiCl^+$	394
$C_4H_6O_2S^+$	357	$C_4H_{10}^+$	56
$C_4H_6O_3^+$	220	$C_4H_{10}Cd^+$	495

$C_4H_{10}F_2Si^+$	308	$C_4O_3SMo^+$	489
$C_4H_{10}Hg^+$	546	$C_4O_3SW^+$	538
$C_4H_{10}N^+$	129	$C_4O_3Cl_2Rh^+$	492
$C_4H_{10}NF_2P^+$	323	$C_4O_4Cr^+$	411
$C_4H_{10}NSe^+$	459	$C_4O_4F_3PFe^+$	434
$C_4H_{10}N_2^+$	148	$C_4O_4F_6P_2Cr^+$	418
$C_4H_{10}N_2O^+$	241	$C_4O_4Fe^+$	430
$C_4H_{10}N_2OS^+$	362	$C_4O_4FeBr_2^+$	480
$C_4H_{10}N_2S_2^+$	350	$C_4O_4FeI_2^+$	516
$C_4H_{10}N_4^+$	164	$C_4O_4Mn^+$	422
$C_4H_{10}O^+$	183	$C_4O_4Mo^+$	486
$C_4H_{10}OS^+$	353	$C_4O_4Ni^+$	443
$C_4H_{10}O_2^+$	207	$C_4O_4W^+$	534
$C_4H_{10}O_2As^+$	456	C_4SBr^+	477
$C_4H_{10}O_2PSCI^+$	402	$C_4SI_4^+$	515
$C_4H_{10}O_2S^+$	358	$C_4S_8^+$	328
$C_4H_{10}O_2SiCl_2^+$	395	C_4Th^+	553
$C_4H_{10}O_3^+$	220	C_4Ti^+	406
$C_4H_{10}O_3PCl^+$	397	C_4U^+	554
$C_4H_{10}S^+$	331	C_5F^+	270
$C_4H_{10}S_2^+$	337	$C_5F_2^+$	270
$C_4H_{10}S_2Sn^+$	502	$C_5F_3^+$	271
$C_4H_{10}Si^+$	295	$C_5F_4^+$	272
$C_4H_{10}Zn^+$	446	$C_5F_5^+$	272
$C_4H_{11}As^+$	454	$C_5F_{15}P_5^+$	321
$C_4H_{11}N^+$	130	C_5HN^+	162
$C_4H_{11}NO^+$	228	$C_5HOF_{11}^+$	287
$C_4H_{11}NO_2^+$	247	$C_5HO_5Mn^+$	423
$C_4H_{11}O_2As^+$	456	$C_5HO_5Re^+$	541
$C_4H_{11}O_2PS_2^+$	370	$C_5H_2^+$	57
$C_4H_{11}O_3P^+$	318	$C_5H_2N_3SCL^+$	401
$C_4H_{11}P^+$	311	$C_5H_2O_2F_4^+$	286
$C_4H_{11}SiCl^+$	394	$C_5H_2O_3Co^+$	438
$C_4H_{12}Al_2Br_2^+$	476	$C_5H_3^+$	57
$C_4H_{12}Al_2Cl_2^+$	393	$C_5H_3Br^+$	465
$C_4H_{12}Al_2I_2^+$	514	$C_5H_3Cl^+$	373
$C_4H_{12}As_2^+$	455	$C_5H_3D_4^+$	60
$C_4H_{12}Ge^+$	449	$C_5H_3I^+$	510
$C_4H_{12}NP^+$	315	$C_5H_3NCl_2^+$	381
$C_4H_{12}N_2^+$	148	$C_5H_3NO^+$	228
$C_4H_{12}N_3FP^+$	322	$C_5H_3NO_5Cr^+$	414
$C_4H_{12}N_3F_4P^+$	323	$C_5H_3NO_5W^+$	535
$C_4H_{12}N_2OPCl^+$	398	$C_5H_3NS^+$	344
$C_4H_{12}N_2OS^+$	362	$C_5H_3NS^+$	350
$C_4H_{12}N_2PCl^+$	397	$C_5H_3N_2OF_3^+$	288
$C_4H_{12}N_2PSCI^+$	402	$C_5H_3N_3O^+$	245
$C_4H_{12}N_2SiCl_2^+$	395	$C_5H_3OS^+$	353
$C_4H_{12}N_4^+$	164	$C_5H_3O_2^+$	207
$C_4H_{12}N_6^+$	167	$C_5H_3O_5GeRe^+$	542
$C_4H_{12}ORe^+$	541	$C_5H_3O_5MnGe^+$	454
$C_4H_{12}PAu^+$	545	$C_5H_3O_5PCr^+$	416
$C_4H_{12}P_2^+$	314	$C_5H_3O_5SiMn^+$	424
$C_4H_{12}Pb^+$	550	$C_5H_3O_5SiRe^+$	541
$C_4H_{12}SGe^+$	452	$C_5H_4^+$	57
$C_4H_{12}SPb^+$	551	$C_5H_4D_3^+$	60
$C_4H_{12}SSn^+$	501	$C_5H_4N^+$	130
$C_4H_{12}Si^+$	295	$C_5H_4NBr^+$	468
$C_4H_{12}SiS^+$	367	$C_5H_4NCl^+$	378
$C_4H_{12}Sn^+$	497	$C_5H_4NOBr^+$	472
$C_4H_{13}NSi^+$	303	$C_5H_4NOCl^+$	385
$C_4H_{13}N_2O_3P^+$	320	$C_5H_4N_2^+$	149
$C_4H_{14}N_3OP^+$	319	$C_5H_4N_2O_2^+$	255
$C_4I_2^+$	509	$C_5H_4N_2O_3^+$	263
C_4La^+	522	$C_5H_4N_4^+$	164
C_4Lu^+	531	$C_5H_4N_4O^+$	246
$C_4NF_3^+$	280	$C_5H_4N_4O_2^+$	260
$C_4N_2^+$	125	$C_5H_4N_4O_3^+$	265
$C_4N_2F_4^+$	280	$C_5H_4O^+$	183
$C_4O_2Cl_2^+$	382	$C_5H_4OS^+$	353
$C_4O_3SCr^+$	419	$C_5H_4OSe^+$	460

$C_5H_4OTe^+$	507	$C_5H_7^+$	58
$C_5H_4O_2^+$	207	$C_5H_7N^+$	130
$C_5H_4O_2S^+$	358	$C_5H_7NOS^+$	361
$C_5H_4O_2Se^+$	461	$C_5H_7NO_2^+$	247
$C_5H_4O_2Te^+$	507	$C_5H_7NO_3^+$	261
$C_5H_4O_3^+$	220	$C_5H_7NS_2^+$	349
$C_5H_4S_2^+$	337	$C_5H_7N_3^+$	162
$C_5H_4S_3^+$	340	$C_5H_7N_3O^+$	246
$C_5H_4^+$	57	$C_5H_8^+$	60
$C_5H_5As^+$	454	$C_5H_8Br_2^+$	466
$C_5H_5Bi^+$	552	$C_5H_8ClBr^+$	479
$C_5H_5Co^+$	437	$C_5H_8FBr^+$	474
$C_5H_5Cr^+$	409	$C_5H_8Ge^+$	449
$C_5H_5F_2P^+$	321	$C_5H_8N^+$	130
$C_5H_5F_3Si^+$	308	$C_5H_8NO^+$	229
$C_5H_5Fe^+$	429	$C_5H_8NO_2Br^+$	473
$C_5H_5Ge^+$	449	$C_5H_8NO_2Cl^+$	387
$C_5H_5In^+$	496	$C_5H_8N_2^+$	149
$C_5H_5La^+$	522	$C_5H_8N_2O^+$	241
$C_5H_5Mg^+$	290	$C_5H_8N_2S^+$	346
$C_5H_5Mn^+$	421	$C_5H_8O^+$	184
$C_5H_5MnI^+$	516	$C_5H_8OS^+$	354
$C_5H_5N^+$	130	$C_5H_8O_2^+$	207
$C_5H_5NO^+$	228	$C_5H_8O_3^+$	220
$C_5H_5NOCr^+$	413	$C_5H_8SCl_2^+$	400
$C_5H_5NONi^+$	443	$C_5H_8S_4^+$	341
$C_5H_5NO_2^+$	247	$C_5H_8Si^+$	295
$C_5H_5NS^+$	344	$C_5H_9^+$	61
$C_5H_5NSCr^+$	418	$C_5H_9Br^+$	465
$C_5H_5N_2OBr^+$	472	$C_5H_9FSi^+$	308
$C_5H_5N_2OCl^+$	387	$C_5H_9I^+$	510
$C_5H_5N_2OF^+$	287	$C_5H_9N^+$	130
$C_5H_5N_5^+$	167	$C_5H_9NO^+$	229
$C_5H_5N_5O^+$	246	$C_5H_9NOSe^+$	461
$C_5H_5Nd^+$	525	$C_5H_9NO_2^+$	247
$C_5H_5Ni^+$	442	$C_5H_9NO_3^+$	261
$C_5H_5OClHg^+$	547	$C_5H_9NS^+$	344
$C_5H_5O_2F_3^+$	286	$C_5H_9NS_2^+$	349
$C_5H_5P^+$	311	$C_5H_9N_3O^+$	246
$C_5H_5Pr^+$	524	$C_5H_9N_3S^+$	348
$C_5H_5Ru^+$	490	$C_5H_9O^+$	184
$C_5H_5SCl^+$	399	$C_5H_9OBr^+$	470
$C_5H_5SClHg^+$	548	$C_5H_9O_2^+$	207
$C_5H_5Sb^+$	505	$C_5H_9O_2F_9SiP_3Mn^+$	425
$C_5H_5Si^+$	295	$C_5H_9O_2SiMn^+$	424
$C_5H_5SiCl_3^+$	395	$C_5H_9O_5PCr^+$	416
$C_5H_5Ti^+$	548	$C_5H_9O_5PW^+$	536
$C_5H_5W^+$	532	$C_5H_9SiBr^+$	476
$C_5H_6^+$	58	$C_5H_9SiCl^+$	394
$C_5H_6Cl_2^+$	375	$C_5H_9SiI^+$	514
$C_5H_6D^+$	60	$C_5H_{10}^+$	61
$C_5H_6N^+$	130	$C_5H_{10}Br_2^+$	467
$C_5H_6N_2^+$	149	$C_5H_{10}Ge^+$	449
$C_5H_6N_2O^+$	241	$C_5H_{10}N^+$	130
$C_5H_6N_2O_2^+$	255	$C_5H_{10}NBr^+$	468
$C_5H_6N_2O_3^+$	263	$C_5H_{10}NCl^+$	378
$C_5H_6O^+$	183	$C_5H_{10}N_2^+$	149
$C_5H_6OC_2^+$	438	$C_5H_{10}N_2O^+$	241
$C_5H_6OS^+$	353	$C_5H_{10}N_2S^+$	346
$C_5H_6OSe^+$	460	$C_5H_{10}N_4^+$	165
$C_5H_6O_2^+$	207	$C_5H_{10}O^+$	184
$C_5H_6O_2S^+$	358	$C_5H_{10}O_2^+$	208
$C_5H_6O_3^+$	220	$C_5H_{10}S^+$	332
$C_5H_6S^+$	331	$C_5H_{10}Si^+$	295
$C_5H_6SSe^+$	462	$C_5H_{11}^+$	62
$C_5H_6STe^+$	508	$C_5H_{11}As^+$	454
$C_5H_6S_2^+$	338	$C_5H_{11}Br^+$	465
$C_5H_6Se^+$	459	$C_5H_{11}I^+$	510
$C_5H_6Si^+$	295	$C_5H_{11}N^+$	131
$C_5H_6Te^+$	507	$C_5H_{11}NO^+$	229

$C_5H_{11}NO_2^+$	247
$C_5H_{11}NO_2S^+$	363
$C_5H_{11}NO_2Se^+$	461
$C_5H_{11}NS^+$	344
$C_5H_{11}N_2OF_2P^+$	324
$C_5H_{11}O^+$	185
$C_5H_{11}O_3P^+$	319
$C_5H_{12}^+$	62
$C_5H_{12}Hg^+$	546
$C_5H_{12}N^+$	131
$C_5H_{12}N_2^+$	149
$C_5H_{12}N_2O^+$	241
$C_5H_{12}N_2OFP^+$	324
$C_5H_{12}N_2S^+$	346
$C_5H_{12}O^+$	185
$C_5H_{12}OGe^+$	451
$C_5H_{12}OS^+$	354
$C_5H_{12}OSi^+$	305
$C_5H_{12}O_2Si^+$	306
$C_5H_{12}S^+$	332
$C_5H_{12}S_2^+$	338
$C_5H_{12}S_2Sn^+$	502
$C_5H_{12}Si^+$	341
$C_5H_{12}Si^+$	295
$C_5H_{12}Sn^+$	498
$C_5H_{13}N^+$	131
$C_5H_{13}NBr_2^+$	469
$C_5H_{13}NO^+$	229
$C_5H_{13}NO_2^+$	248
$C_5H_{13}N_2OP^+$	319
$C_5H_{14}N_2^+$	150
$C_5H_{14}Si^+$	296
$C_5H_{14}Sn^+$	498
$C_5H_{15}NSi^+$	303
$C_5H_{15}PS_2Sn^+$	502
$C_5H_{15}P_5^+$	315
$C_5H_{15}Ta^+$	532
$C_5H_{16}N_4OP^+$	320
$C_5NCl_5^+$	378
$C_5NF_5^+$	280
$C_5NOCl_5^+$	385
$C_5N_1^+$	125
$C_5OF_6Co_2^+$	440
$C_5O_5Scr^+$	419
$C_5O_5SMo^+$	489
$C_5O_5SW^+$	538
$C_5O_5BrRe^+$	542
$C_5O_5ClMn^+$	428
$C_5O_5ClRe^+$	542
$C_5O_5Cr^+$	411
$C_5O_5F_3PCr^+$	418
$C_5O_5F_3PMo^+$	489
$C_5O_5F_3PW^+$	538
$C_5O_5Fe^+$	430
$C_5O_5IRe^+$	542
$C_5O_5MnBr^+$	480
$C_5O_5MnI^+$	516
$C_5O_5Mo^+$	486
$C_5O_5PBr_3Mo^+$	490
$C_5O_5PCl_3Cr^+$	420
$C_5O_5PCl_3Mo^+$	489
$C_5O_5PCl_3W^+$	538
$C_5O_5PCrBr_3^+$	480
$C_5O_5SiCl_3Mn^+$	428
$C_5O_5W^+$	534
$C_5S_{10}^+$	328
$C_6Cl_4^+$	371
$C_6Cl_4^+$	371
$C_6D_{12}^+$	69
$C_6D_{12}O_2^+$	210

$C_6F_3Br_3^+$	474
$C_6F_3Cl_4^+$	391
$C_6F_4^+$	272
$C_6F_4Br_2^+$	474
$C_6F_5^+$	272
$C_6F_5Br^+$	473
$C_6F_5Cl^+$	390
$C_6F_5I^+$	514
$C_6F_6^+$	273
$C_6F_6N_2^+$	280
$C_6F_{12}^+$	273
$C_6F_{12}P_2^+$	321
$C_6F_{13}P_3^+$	321
$C_6HCl_5^+$	377
$C_6HFCI_4^+$	392
$C_6HF_2Cl_2^+$	392
$C_6HF_2Br^+$	475
$C_6HF_4Cl^+$	392
$C_6HF_5^+$	278
$C_6HOF_5^+$	286
$C_6HS_2Br_3^+$	478
$C_6H_1^+$	62
$C_6H_2Cl_2^+$	375
$C_6H_2Cl_4^+$	377
$C_6H_2FCl_3^+$	392
$C_6H_2F_2Br_2^+$	475
$C_6H_2F_2Cl_2^+$	392
$C_6H_2F_3Br^+$	475
$C_6H_2F_3Cl^+$	391
$C_6H_2F_4^+$	278
$C_6H_2NF_5^+$	283
$C_6H_2OF_4^+$	286
$C_6H_2O_2Cl_4^+$	385
$C_6H_2O_4Cl_2Fe^+$	436
$C_6H_2O_4Co_2^+$	438
$C_6H_2O_4FeBr_2^+$	480
$C_6H_2S_2Br_2^+$	478
$C_6H_3Br_4^+$	467
$C_6H_3Cl_3^+$	377
$C_6H_3D_2^+$	64
$C_6H_3FBr_2^+$	475
$C_6H_3FCl_2^+$	392
$C_6H_3F_2Br^+$	475
$C_6H_3F_2Cl^+$	391
$C_6H_3F_3^+$	277
$C_6H_3Ge^+$	449
$C_6H_3NO_3MnBr^+$	480
$C_6H_3N_3^+$	162
$C_6H_3N_3O_6^+$	267
$C_6H_3N_5^+$	167
$C_6H_3OF_3^+$	286
$C_6H_3OF_3S^+$	367
$C_6H_3OF_3Se^+$	461
$C_6H_3O_2F_3^+$	286
$C_6H_3O_5Mn^+$	423
$C_6H_3O_5Re^+$	541
$C_6H_3S_2Br^+$	478
$C_6H_3S_2I^+$	515
$C_6H_3Si^+$	296
$C_6H_4^+$	62
$C_6H_4Br^+$	465
$C_6H_4BrI^+$	517
$C_6H_4Br_2^+$	467
$C_6H_4Cl^+$	373
$C_6H_4Cl_2^+$	376
$C_6H_4D_2^+$	65
$C_6H_4F^+$	275
$C_6H_4FBr^+$	474
$C_6H_4FCl^+$	391
$C_6H_4F_2^+$	277

$C_6H_4I_2^+$	511	$C_6H_5PCl_2^+$	397
$C_6H_5NF_3^+$	282	$C_6H_5PSCl_2^+$	402
$C_6H_5NOCl^+$	385	$C_6H_5SFe^+$	434
$C_6H_5NOF_3^+$	288	$C_6H_5SFe_2^+$	435
$C_6H_5NO_2^+$	248	$C_6H_5SMn^+$	425
$C_6H_5NO_3Br^+$	473	$C_6H_5SMnI^+$	516
$C_6H_5NO_2Cl^+$	388	$C_6H_5SMn_2^+$	426
$C_6H_5NO_2F^+$	288	$C_6H_5Sb^+$	505
$C_6H_5NO_2I^+$	513	$C_6H_5SiSiCl_3^+$	402
$C_6H_5N_2^+$	150	$C_6H_6^+$	64
$C_6H_5N_2O^+$	241	$C_6H_6^{+2}$	65
$C_6H_5N_2O_4^+$	266	$C_6H_6Cr^+$	409
$C_6H_5N_2O_5^+$	267	$C_6H_6D_4^+$	68
$C_6H_5N_2S^+$	346	$C_6H_6N^+$	131
$C_6H_5N_2Se^+$	460	$C_6H_6NBr^+$	468
$C_6H_5N_3Cl^+$	380	$C_6H_6NCl^+$	378
$C_6H_5N_3O_2^+$	261	$C_6H_6NF^+$	281
$C_6H_5O^+$	185	$C_6H_6NI^+$	512
$C_6H_5OBr^+$	470	$C_6H_6NO^+$	229
$C_6H_5OBr_2^+$	472	$C_6H_6NOCl_3^+$	389
$C_6H_5OCl^+$	383	$C_6H_6N_2^+$	150
$C_6H_5OCl_2^+$	384	$C_6H_6N_2O^+$	241
$C_6H_5OF^+$	284	$C_6H_6N_2O_2^+$	255
$C_6H_5OF_2^+$	285	$C_6H_6N_3^+$	165
$C_6H_5OI^+$	513	$C_6H_6O^+$	185
$C_6H_5O_2^+$	208	$C_6H_6OS^+$	354
$C_6H_5O_3^+$	220	$C_6H_6OSe^+$	460
$C_6H_5O_3S^+$	359	$C_6H_6OTe^+$	507
$C_6H_5O_3Fe^+$	432	$C_6H_6O_2^+$	209
$C_6H_5S^+$	332	$C_6H_6O_2Co_2^+$	438
$C_6H_5S_2^+$	338	$C_6H_6O_2S^+$	358
$C_6H_5S_2Se_2^+$	462	$C_6H_6O_2S_2^+$	360
$C_6H_5S_4^+$	341	$C_6H_6O_2Se^+$	461
$C_6H_5Se^+$	459	$C_6H_6O_2Te^+$	507
$C_6H_5Se_4^+$	459	$C_6H_6O_3^+$	220
$C_6H_5^+$	63	$C_6H_6O_3F_9P^+$	324
$C_6H_5As^+$	454	$C_6H_6O_3^+$	222
$C_6H_5Bi^+$	552	$C_6H_6O_6PCr^+$	417
$C_6H_5Br^+$	465	$C_6H_6O_6PW^+$	537
$C_6H_5Cl^+$	373	$C_6H_6S^+$	332
$C_6H_5Cl^+$	372	$C_6H_6S_3^+$	340
$C_6H_5ClCr^+$	420	$C_6H_6W_2^+$	533
$C_6H_5F^+$	275	$C_6H_7^+$	65
$C_6H_5I^+$	510	$C_6H_7D_4^+$	68
$C_6H_5N^+$	131	$C_6H_7F_6As^+$	456
$C_6H_5NBr_2^+$	469	$C_6H_7Mn^+$	421
$C_6H_5NCl_2^+$	381	$C_6H_7MnI^+$	516
$C_6H_5NF_2^+$	282	$C_6H_7N^+$	131
$C_6H_5NO^+$	229	$C_6H_7NCr^+$	410
$C_6H_5NOSCr^+$	419	$C_6H_7NF_6^+$	283
$C_6H_5NOSMn^+$	427	$C_6H_7NO^+$	226
$C_6H_5NOSMnI^+$	516	$C_6H_7NO^+$	230
$C_6H_5NO_2^+$	248	$C_6H_7NONi^+$	443
$C_6H_5NO_2Cr^+$	414	$C_6H_7NOS^+$	361
$C_6H_5NO_3^+$	226	$C_6H_7NO_2^+$	248
$C_6H_5NO_3^+$	261	$C_6H_7NS^+$	344
$C_6H_5N_3^+$	162	$C_6H_7N_2^+$	150
$C_6H_5N_3F_5P_3^+$	323	$C_6H_7N_2OCl^+$	387
$C_6H_5N_3OS^+$	363	$C_6H_7N_3^+$	167
$C_6H_5N_3O_3^+$	266	$C_6H_7P^+$	311
$C_6H_5O^+$	185	$C_6H_8^+$	65
$C_6H_5OBr^+$	470	$C_6H_8D_2^+$	68
$C_6H_5OCl^+$	383	$C_6H_8Ge^+$	449
$C_6H_5OF^+$	285	$C_6H_8N^+$	132
$C_6H_5OI^+$	513	$C_6H_8N_2^+$	150
$C_6H_5OMn^+$	422	$C_6H_8N_2O^+$	242
$C_6H_5OPCl_3^+$	398	$C_6H_8N_2O_2^+$	256
$C_6H_5OW^+$	534	$C_6H_8O^+$	186
$C_6H_5O_2^+$	208	$C_6H_8OS^+$	354
$C_6H_5O_2PCl_2^+$	398	$C_6H_8OSe^+$	460

$C_6H_8O_2^+$	209	$C_6H_{12}S_4Sn^+$	502
$C_6H_8O_3^+$	223	$C_6H_{12}Si^+$	296
$C_6H_8S^+$	332	$C_6H_{12}Si_4Cl_4^+$	395
$C_6H_8SSe^+$	462	$C_6H_{13}^+$	69
$C_6H_8S_2^+$	338	$C_6H_{13}I^+$	511
$C_6H_8S_4^+$	341	$C_6H_{13}N^+$	133
$C_6H_8Si^+$	296	$C_6H_{13}NO^+$	230
$C_6H_8^+$	66	$C_6H_{13}NO_2^+$	248
$C_6H_9D^+$	68	$C_6H_{13}NO_3Si^+$	307
$C_6H_9Ga^+$	448	$C_6H_{13}O_3P^+$	319
$C_6H_9N^+$	132	$C_6H_{13}P^+$	311
$C_6H_9NOS^+$	361	$C_6H_{14}^+$	70
$C_6H_9NS_2^+$	349	$C_6H_{14}Cd^+$	495
$C_6H_9N_3^+$	162	$C_6H_{14}Ge^+$	450
$C_6H_9N_3O^+$	246	$C_6H_{14}Hg^+$	546
$C_6H_9O_3F_6SiP_2Mn^+$	425	$C_6H_{14}N_2^+$	151
$C_6H_9O_3SiMn^+$	424	$C_6H_{14}N_3O^+$	242
$C_6H_9O_6PCr^+$	417	$C_6H_{14}O^+$	187
$C_6H_9O_6PW^+$	537	$C_6H_{14}OS^+$	354
$C_6H_9P^+$	311	$C_6H_{14}O_2^+$	210
$C_6H_{10}^+$	66	$C_6H_{14}O_3PCl^+$	397
$C_6H_{10}Br_2^+$	467	$C_6H_{14}S^+$	332
$C_6H_{10}ClBr^+$	479	$C_6H_{14}S_2^+$	338
$C_6H_{10}FBr^+$	474	$C_6H_{14}Si^+$	296
$C_6H_{10}NOCl^+$	385	$C_6H_{14}Sn^+$	498
$C_6H_{10}N_2^+$	151	$C_6H_{15}FSi^+$	308
$C_6H_{10}N_2O^+$	242	$C_6H_{15}N^+$	133
$C_6H_{10}N_2O_2^+$	256	$C_6H_{15}NBr_2^+$	469
$C_6H_{10}N_2O_4^+$	263	$C_6H_{15}NO^+$	230
$C_6H_{10}N_2S^+$	346	$C_6H_{15}NO_3^+$	262
$C_6H_{10}Ni^+$	442	$C_6H_{15}NS_2Sn^+$	502
$C_6H_{10}O^+$	186	$C_6H_{15}N_3^+$	162
$C_6H_{10}O_2^+$	209	$C_6H_{15}O_3P^+$	319
$C_6H_{10}O_3^+$	220	$C_6H_{15}O_3PCr^+$	416
$C_6H_{10}O_4^+$	223	$C_6H_{15}O_4PS^+$	369
$C_6H_{10}Pd^+$	492	$C_6H_{15}O_4SiCl^+$	395
$C_6H_{10}Pt^+$	543	$C_6H_{15}O_4P^+$	319
$C_6H_{10}S^+$	332	$C_6H_{15}P^+$	311
$C_6H_{10}S_2^+$	338	$C_6H_{15}PS_2^+$	369
$C_6H_{10}S_4^+$	342	$C_6H_{15}Si^+$	296
$C_6H_{11}^+$	69	$C_6H_{15}SiCl^+$	394
$C_6H_{11}Br^+$	465	$C_6H_{16}N_2^+$	152
$C_6H_{11}Cl^+$	373	$C_6H_{16}N_3P^+$	316
$C_6H_{11}I^+$	511	$C_6H_{16}N_4^+$	165
$C_6H_{11}N^+$	132	$C_6H_{16}Si^+$	296
$C_6H_{11}NO^+$	230	$C_6H_{16}Si_4^+$	302
$C_6H_{11}NOS^+$	361	$C_6H_{16}Sn^+$	498
$C_6H_{11}NO_2^+$	248	$C_6H_{17}NSi^+$	303
$C_6H_{11}NO_3^+$	262	$C_6H_{18}GeSn^+$	503
$C_6H_{11}N_2Cl^+$	379	$C_6H_{18}Ge_2^+$	450
$C_6H_{11}O^+$	187	$C_6H_{18}NSiP^+$	325
$C_6H_{11}OS^+$	354	$C_6H_{18}N_2Si_2^+$	304
$C_6H_{11}O_2^+$	209	$C_6H_{18}N_3F_3P^+$	323
$C_6H_{11}O_2P^+$	318	$C_6H_{18}N_3OP^+$	320
$C_6H_{12}^+$	69	$C_6H_{18}N_3P^+$	316
$C_6H_{12}F_4Si_4^+$	309	$C_6H_{18}N_3PCr^+$	416
$C_6H_{12}Ge^+$	449	$C_6H_{18}N_3PFe^+$	433
$C_6H_{12}NO^+$	230	$C_6H_{18}N_3PMo^+$	488
$C_6H_{12}NOBr^+$	472	$C_6H_{18}N_3PS^+$	369
$C_6H_{12}N_2^+$	151	$C_6H_{18}OSi_2^+$	306
$C_6H_{12}N_2O_2^+$	256	$C_6H_{18}PAu^+$	545
$C_6H_{12}N_2S^+$	347	$C_6H_{18}P_2Cl_3Pt^+$	544
$C_6H_{12}N_3^+$	165	$C_6H_{18}P_2I_2Pt^+$	544
$C_6H_{12}O^+$	187	$C_6H_{18}Pb_2^+$	550
$C_6H_{12}OS^+$	354	$C_6H_{18}Re^+$	540
$C_6H_{12}O_2^+$	210	$C_6H_{18}SGe_2^+$	453
$C_6H_{12}O_4^+$	223	$C_6H_{18}SPb_2^+$	551
$C_6H_{12}S^+$	332	$C_6H_{18}SSn_2^+$	502
$C_6H_{12}S_3^+$	340	$C_6H_{18}SiGe^+$	452
$C_6H_{12}S_4^+$	342	$C_6H_{18}SiSn^+$	501

$C_6H_{18}Si_2^+$	299	$C_7H_5N_2O_3Cl^+$	388
$C_6H_{18}Si_2S^+$	368	$C_7H_5N_3O_6^+$	267
$C_6H_{18}Sn_2^+$	500	$C_7H_5O^+$	187
$C_6H_{18}W^+$	532	$C_7H_5OCl^+$	383
$C_6H_{19}NSi_2^+$	304	$C_7H_5OClCr^+$	420
$C_6N_2^+$	125	$C_7H_5OSFe^+$	435
$C_6N_4^+$	125	$C_7H_5OSMn^+$	426
$C_6O_2Cl_2^+$	382	$C_7H_5O_2^+$	210
$C_6O_2F_4^+$	284	$C_7H_5O_2Br^+$	471
$C_6O_2F_6Co_2^+$	440	$C_7H_5O_2ClFe^+$	436
$C_6O_5CrSe^+$	462	$C_7H_5O_2F^+$	285
$C_6O_5F_3Mn^+$	423	$C_7H_5O_2F_3PMn^+$	425
$C_6O_5SCr^+$	419	$C_7H_5O_2FeBr^+$	480
$C_6O_5SMo^+$	489	$C_7H_5O_2FeI^+$	516
$C_6O_5SW^+$	538	$C_7H_5O_2Mn^+$	422
$C_6O_6Cr^+$	411	$C_7H_5O_2PCl_3Mn^+$	428
$C_6O_6Mo^+$	486	$C_7H_5O_2PMnBr_3^+$	480
$C_6O_6S_2Fe_2^+$	435	$C_7H_5O_2W^+$	534
$C_6O_6W^+$	534	$C_7H_5S_2Fe_2^+$	435
$C_6S_2Br_4^+$	477	$C_7H_5S_2Mn^+$	426
$C_7F_8^+$	273	$C_7H_5S_2Mn_2^+$	426
$C_7HO_4F_6Ir^+$	543	$C_7H_6^+$	70
$C_7HO_4F_6Rh^+$	491	$C_7H_6Cl^+$	373
$C_7H_2O_5Co_2^+$	439	$C_7H_6Cl_2^+$	376
$C_7H_3F_5^+$	278	$C_7H_6F^+$	275
$C_7H_3NO_2S^+$	363	$C_7H_6NO^+$	231
$C_7H_3NO_3^+$	262	$C_7H_6NOCl^+$	386
$C_7H_3NO_3Fe^+$	433	$C_7H_6NOF^+$	287
$C_7H_3NO_3Cr^+$	414	$C_7H_6NO_2^+$	248
$C_7H_3OF_5^+$	286	$C_7H_6N_2^+$	152
$C_7H_3O_6Fe^+$	432	$C_7H_6N_2O_3^+$	264
$C_7H_3F_6Br^+$	475	$C_7H_6N_2O_5^+$	267
$C_7H_3F_3Cl^+$	391	$C_7H_6O^+$	188
$C_7H_3F_4^+$	278	$C_7H_6OCr^+$	411
$C_7H_4N^+$	133	$C_7H_6O_2^+$	210
$C_7H_4NF^+$	281	$C_7H_6O_3^+$	220
$C_7H_4NI^+$	512	$C_7H_6O_3Co_2^+$	438
$C_7H_4NO^+$	230	$C_7H_6O_3Fe^+$	431
$C_7H_4NOCl^+$	385	$C_7H_6O_5ClMnSn^+$	503
$C_7H_4NO_2^+$	248	$C_7H_6O_6SCr^+$	419
$C_7H_4NO_3^+$	262	$C_7H_6O_7PCr^+$	417
$C_7H_4N_2O_2^+$	256	$C_7H_6O_7PW^+$	537
$C_7H_4N_2O_3^+$	263	$C_7H_6S_2^+$	338
$C_7H_4OBr^+$	471	$C_7H_6Si^+$	296
$C_7H_4OCl^+$	383	$C_7H_7^+$	70
$C_7H_4OF^+$	285	$C_7H_7Br^+$	465
$C_7H_4O_3Fe^+$	431	$C_7H_7Cl^+$	373
$C_7H_4O_3PMn^+$	424	$C_7H_7ClHg^+$	547
$C_7H_4O_4F_3Rh^+$	491	$C_7H_7F^+$	275
$C_7H_4O_5Fe^+$	432	$C_7H_7FSiBr^+$	476
$C_7H_4O_8SCr^+$	419	$C_7H_7FSiCl^+$	396
$C_7H_4S_2Mn^+$	426	$C_7H_7I^+$	511
$C_7H_4S_2Mn_2^+$	426	$C_7H_7NO^+$	231
$C_7H_4S_3^+$	340	$C_7H_7NOCr^+$	413
$C_7H_5D_2^+$	72	$C_7H_7NOS^+$	361
$C_7H_5F_3^+$	277	$C_7H_7NOSMn^+$	427
$C_7H_5N^+$	133	$C_7H_7NOSMnI^+$	516
$C_7H_5NO^+$	231	$C_7H_7NO_2^+$	249
$C_7H_5NOS^+$	361	$C_7H_7NO_2FSi^+$	309
$C_7H_5NOS_2Mn^+$	428	$C_7H_7NO_2S^+$	363
$C_7H_5NOS_2Mn_2^+$	428	$C_7H_7NO_3^+$	262
$C_7H_5NO_2S^+$	363	$C_7H_7NO_5W^+$	535
$C_7H_5NO_2SCr^+$	419	$C_7H_7N_2FS^+$	366
$C_7H_5NO_3Cr^+$	414	$C_7H_7N_2O^+$	242
$C_7H_5NO_4^+$	265	$C_7H_7N_2OBr^+$	473
$C_7H_5NO_5Cr^+$	414	$C_7H_7N_2OCl^+$	387
$C_7H_5NS^+$	344	$C_7H_7N_2OF^+$	287
$C_7H_5NS_2^+$	349	$C_7H_7N_2OI^+$	513
$C_7H_5N_2Cl^+$	379	$C_7H_7N_2S^+$	347
$C_7H_5N_2O_3^+$	263	$C_7H_7N_2SBr^+$	478

$C_7H_7N_2SCl^+$	400	$C_7H_{10}SSe^+$	462
$C_7H_7N_2SI^+$	515	$C_7H_{10}S_2^+$	338
$C_7H_7N_2O_2S^+$	364	$C_7H_{10}S_3^+$	340
$C_7H_7O^+$	189	$C_7H_{11}^+$	74
$C_7H_7OBr^+$	471	$C_7H_{11}N^+$	135
$C_7H_7OCl^+$	383	$C_7H_{11}NO^+$	231
$C_7H_7OF^+$	285	$C_7H_{11}NO_2^+$	249
$C_7H_7OI^+$	513	$C_7H_{11}N_3O^+$	246
$C_7H_7OMn^+$	422	$C_7H_{11}OCl^+$	384
$C_7H_7O_2^+$	210	$C_7H_{11}O_2Br^+$	471
$C_7H_7O_4^+$	223	$C_7H_{11}P^+$	311
$C_7H_7O_4Ir^+$	543	$C_7H_{12}^+$	74
$C_7H_7O_3Rh^+$	491	$C_7H_{12}NBr^+$	468
$C_7H_7SBr^+$	478	$C_7H_{12}NCl^+$	379
$C_7H_7SMn^+$	425	$C_7H_{12}NI^+$	512
$C_7H_7SMnI^+$	516	$C_7H_{12}NO_2^+$	249
$C_7H_8^+$	72	$C_7H_{12}N_2^+$	152
$C_7H_8^{+2}$	73	$C_7H_{12}N_2O^+$	242
$C_7H_8Cr^+$	409	$C_7H_{12}N_2O_2^+$	256
$C_7H_8FSi^+$	308	$C_7H_{12}O^+$	191
$C_7H_8N^+$	134	$C_7H_{12}O_2^+$	211
$C_7H_8N_2^+$	152	$C_7H_{12}O_4^+$	223
$C_7H_8N_2O^+$	242	$C_7H_{12}S^+$	333
$C_7H_8N_2OS^+$	362	$C_7H_{12}S_4^+$	342
$C_7H_8N_2O_2^+$	256	$C_7H_{13}^+$	74
$C_7H_8N_2S^+$	347	$C_7H_{13}N^+$	135
$C_7H_8O^+$	189	$C_7H_{13}NO^+$	232
$C_7H_8OCr^+$	411	$C_7H_{13}OS^+$	355
$C_7H_8OS^+$	355	$C_7H_{13}O_2^+$	211
$C_7H_8OS_2^+$	360	$C_7H_{14}^+$	74
$C_7H_8O_2^+$	210	$C_7H_{14}N_2^+$	153
$C_7H_8O_2PMn^+$	424	$C_7H_{14}N_2O^+$	242
$C_7H_8O_2S^+$	358	$C_7H_{14}O^+$	191
$C_7H_8S^+$	333	$C_7H_{14}OS^+$	355
$C_7H_8S_3^+$	340	$C_7H_{14}O_2^+$	211
$C_7H_8SiCl^+$	394	$C_7H_{15}^+$	75
$C_7H_8Te^+$	507	$C_7H_{15}N^+$	135
$C_7H_9^+$	73	$C_7H_{15}NO^+$	232
$C_7H_9Br^+$	465	$C_7H_{15}NO_2Si^+$	307
$C_7H_9N^+$	134	$C_7H_{15}O_2P^+$	318
$C_7H_9NO^+$	231	$C_7H_{15}O_4PCr^+$	416
$C_7H_9NOS^+$	361	$C_7H_{15}O_4PW^+$	536
$C_7H_9NOSe^+$	461	$C_7H_{15}P^+$	311
$C_7H_9NOTe^+$	507	$C_7H_{16}Hg^+$	546
$C_7H_9NO_2^+$	249	$C_7H_{16}N_2^+$	153
$C_7H_9NS^+$	345	$C_7H_{16}N_3OF_2P^+$	324
$C_7H_9NSe^+$	460	$C_7H_{16}N_4^+$	165
$C_7H_9N_3S^+$	348	$C_7H_{16}S_2Sn^+$	502
$C_7H_9N_5^+$	167	$C_7H_{16}Sn^+$	498
$C_7H_9O_4CoSn^+$	503	$C_7H_{17}NO^+$	232
$C_7H_9O_4F_3SiPMn^+$	425	$C_7H_{17}OPS^+$	369
$C_7H_9O_4PFe^+$	433	$C_7H_{18}Ge^+$	450
$C_7H_9O_4SiMn^+$	424	$C_7H_{18}NP^+$	315
$C_7H_9O_7PCr^+$	417	$C_7H_{18}N_2^+$	153
$C_7H_9O_7PW^+$	537	$C_7H_{18}N_2Si^+$	303
$C_7H_9Si^+$	296	$C_7H_{18}N_3OPCr^+$	418
$C_7H_{10}^+$	73	$C_7H_{18}N_3OPFe^+$	433
$C_7H_{10}F_6Si^+$	308	$C_7H_{18}N_3OPMo^+$	488
$C_7H_{10}N^+$	135	$C_7H_{18}Pb^+$	550
$C_7H_{10}NO^+$	231	$C_7H_{18}Sn^+$	498
$C_7H_{10}NO_2^+$	249	$C_7H_{19}NSi^+$	303
$C_7H_{10}N_2^+$	152	$C_7H_{19}O_2Si_2^+$	306
$C_7H_{10}N_2O^+$	242	$C_7H_{19}SiAs^+$	456
$C_7H_{10}N_2O_2^+$	256	$C_7H_{19}SiP^+$	325
$C_7H_{10}O^+$	190	$C_7H_{20}Si_2^+$	299
$C_7H_{10}OS^+$	355	$C_7H_{21}P_2ClPt^+$	543
$C_7H_{10}OSe^+$	460	$C_7H_{21}P_2IPt^+$	544
$C_7H_{10}O_2^+$	211	$C_7NF_5^+$	280
$C_7H_{10}S^+$	333	$C_7O_3F_6Co_2^+$	440

$C_7O_6F_3Re^+$	541	$C_8H_7D_2NO_2^+$	250
$C_8F_{10}^+$	273	$C_8H_7N^+$	135
$C_8F_{20}P^+$	321	$C_8H_7NO^+$	232
$C_8HO_2F_{17}^+$	287	$C_8H_7NOBr^+$	472
$C_8H_2^+$	75	$C_8H_7NOBr_2^+$	473
$C_8H_3N_2F_4^+$	283	$C_8H_7NOCl^+$	386
$C_8H_2O_6Co_2^+$	439	$C_8H_7NOCl_2^+$	388
$C_8H_3F_5^+$	278	$C_8H_7NOF_2^+$	288
$C_8H_3NF_4^+$	282	$C_8H_7NOS^+$	361
$C_8H_3NO_5SCr^+$	419	$C_8H_7NO_2^+$	250
$C_8H_3NO_6Cr^+$	415	$C_8H_7NO_2Cr^+$	414
$C_8H_3Ge^+$	450	$C_8H_7NO_2S^+$	363
$C_8H_4NO^+$	232	$C_8H_7NO_3^+$	262
$C_8H_4N_2^+$	153	$C_8H_7NO_4^+$	265
$C_8H_4N_2F_2^+$	282	$C_8H_7NS^+$	345
$C_8H_4N_2O_3Cr^+$	415	$C_8H_7NS_2^+$	349
$C_8H_4O^+$	191	$C_8H_7O^+$	191
$C_8H_4O_2^+$	211	$C_8H_7OBr^+$	471
$C_8H_4O_2S^+$	358	$C_8H_7OCl^+$	384
$C_8H_4O_2S_3^+$	360	$C_8H_7OSMn^+$	426
$C_8H_4O_3^+$	221	$C_8H_7O_2^+$	212
$C_8H_4S_3^+$	340	$C_8H_7O_2Br^+$	471
$C_8H_4S_3Br_2^+$	478	$C_8H_7O_2Cl^+$	384
$C_8H_4Si^+$	296	$C_8H_7O_2F^+$	285
$C_8H_3Br^+$	466	$C_8H_7O_2I^+$	513
$C_8H_3Cl^+$	374	$C_8H_7O_2Mn^+$	422
$C_8H_3I^+$	511	$C_8H_8^+$	75
$C_8H_3NO_2^+$	249	$C_8H_8Cl_2^+$	376
$C_8H_3N_2F^+$	281	$C_8H_8La^+$	522
$C_8H_3N_2OCl^+$	387	$C_8H_8NFS^+$	366
$C_8H_3N_3O_3^+$	265	$C_8H_8NO^+$	232
$C_8H_3O_2ClCr^+$	420	$C_8H_8NOBr^+$	472
$C_8H_3O_2SMn^+$	427	$C_8H_8NOCl^+$	386
$C_8H_3O_3^+$	221	$C_8H_8NOF^+$	287
$C_8H_3O_3Mn^+$	422	$C_8H_8NOI^+$	513
$C_8H_3O_3Re^+$	541	$C_8H_8NO_2^+$	250
$C_8H_3O_3W^+$	534	$C_8H_8NO_2Cl^+$	388
$C_8H_6^+$	75	$C_8H_8NS^+$	345
$C_8H_6Cl_2^+$	376	$C_8H_8NSBr^+$	478
$C_8H_6D_3O^+$	192	$C_8H_8NSCl^+$	400
$C_8H_6N^+$	135	$C_8H_8NSI^+$	515
$C_8H_6NOF_4^+$	288	$C_8H_8N_2^+$	154
$C_8H_6NSBr^+$	478	$C_8H_8N_2O_2Cl_3^+$	388
$C_8H_6NSCl^+$	400	$C_8H_8N_2O_3^+$	264
$C_8H_6N_2^+$	154	$C_8H_8N_2S^+$	347
$C_8H_6N_2O^+$	242	$C_8H_8Nd^+$	525
$C_8H_6N_2O_2^+$	256	$C_8H_8Ni^+$	442
$C_8H_6N_2O_2S^+$	364	$C_8H_8O^+$	191
$C_8H_6N_2O_4Cl_2^+$	389	$C_8H_8OCr^+$	411
$C_8H_6N_2S_2^+$	350	$C_8H_8O_2^+$	212
$C_8H_6O^+$	191	$C_8H_8O_2Cr^+$	411
$C_8H_6O_2Br_2^+$	472	$C_8H_8O_2Fe^+$	431
$C_8H_6O_2Cl_2^+$	385	$C_8H_8O_3^+$	221
$C_8H_6O_2Cr^+$	411	$C_8H_8O_3Fe^+$	431
$C_8H_6O_2F_2^+$	285	$C_8H_8Pr^+$	524
$C_8H_6O_2Hg^+$	547	$C_8H_8Ru^+$	490
$C_8H_6O_2I_2^+$	513	$C_8H_8S^+$	333
$C_8H_6O_4^+$	223	$C_8H_8S_2^+$	338
$C_8H_6O_4Co_2^+$	439	$C_8H_8W_2^+$	533
$C_8H_6O_5Fe^+$	432	$C_8H_9^+$	76
$C_8H_6O_5SCr^+$	419	$C_8H_9Cl^+$	374
$C_8H_6O_6Cr^+$	413	$C_8H_9N^+$	136
$C_8H_6O_6Fe^+$	432	$C_8H_9NO^+$	233
$C_8H_6O_7^+$	333	$C_8H_9NOS^+$	361
$C_8H_6S_2^+$	338	$C_8H_9NO_2^+$	250
$C_8H_6S_2Hg^+$	547	$C_8H_9NO_2S^+$	363
$C_8H_6S_3^+$	341	$C_8H_9NO_3Cr^+$	414
$C_8H_6Se^+$	459	$C_8H_9NO_3W^+$	535
$C_8H_6Te^+$	507	$C_8H_9NS^+$	345
$C_8H_7Cl^+$	374	$C_8H_9N_2O^+$	243

$C_8H_9N_2OCl^+$	387
$C_8H_9N_2S^+$	347
$C_8H_9N_2SCl^+$	400
$C_8H_9O^+$	192
$C_8H_9OBr^+$	471
$C_8H_9OCl^+$	384
$C_8H_9OF^+$	285
$C_8H_9O_3MnSn^+$	503
$C_8H_9O_3PG^+$	416
$C_8H_9O_3PMo^+$	488
$C_8H_9O_3PW^+$	536
$C_8H_9O_3SiMn^+$	424
$C_8H_9O_3SnRe^+$	542
$C_8H_9O_8PCr^+$	417
$C_8H_9O_8PMo^+$	488
$C_8H_9O_8PW^+$	537
$C_8H_{10}^+$	77
$C_8H_{10}Cr^+$	409
$C_8H_{10}FSi^+$	308
$C_8H_{10}FSiBr^+$	476
$C_8H_{10}FSiCl^+$	396
$C_8H_{10}N^+$	136
$C_8H_{10}NCl^+$	379
$C_8H_{10}NO_2FSi^+$	309
$C_8H_{10}N_2Cl_2^+$	381
$C_8H_{10}N_2O^+$	243
$C_8H_{10}N_2OS^+$	362
$C_8H_{10}N_2O_2^+$	256
$C_8H_{10}N_2S^+$	347
$C_8H_{10}N_2S_2^+$	350
$C_8H_{10}N_3F_3P_3^+$	323
$C_8H_{10}N_3O_2^+$	261
$C_8H_{10}O^+$	192
$C_8H_{10}OFSi^+$	309
$C_8H_{10}OS^+$	355
$C_8H_{10}OSe^+$	460
$C_8H_{10}O_2^+$	212
$C_8H_{10}O_6PW^+$	537
$C_8H_{10}S^+$	333
$C_8H_{10}SSe^+$	462
$C_8H_{10}S_2^+$	338
$C_8H_{10}Se_2^+$	459
$C_8H_{11}^+$	78
$C_8H_{11}As^+$	454
$C_8H_{11}FSi^+$	308
$C_8H_{11}F_3Si_2^+$	309
$C_8H_{11}F_6As^+$	456
$C_8H_{11}N^+$	136
$C_8H_{11}NO^+$	233
$C_8H_{11}NOS^+$	362
$C_8H_{11}NS_2^+$	349
$C_8H_{11}OSi^+$	305
$C_8H_{11}O_2F_3^+$	286
$C_8H_{11}O_3SMn^+$	427
$C_8H_{11}P^+$	311
$C_8H_{11}SGe^+$	452
$C_8H_{11}SPb^+$	551
$C_8H_{11}SSn^+$	501
$C_8H_{11}Si^+$	296
$C_8H_{11}SiS^+$	367
$C_8H_{11}SiSCl^+$	402
$C_8H_{11}Si_2Cl_3^+$	395
$C_8H_{12}^+$	78
$C_8H_{12}N^+$	137
$C_8H_{12}NO^+$	233
$C_8H_{12}NO_2^+$	250
$C_8H_{12}N_2^+$	154
$C_8H_{12}N_2O^+$	243
$C_8H_{12}N_2O_2S_4Fe^+$	436
$C_8H_{12}N_4^+$	165

$C_8H_{12}O^+$	193
$C_8H_{12}OS^+$	355
$C_8H_{12}O_2^+$	212
$C_8H_{12}O_8CrMo^+$	489
$C_8H_{12}O_8Cr_2^+$	413
$C_8H_{12}O_8Mo_2^+$	487
$C_8H_{12}S^+$	334
$C_8H_{12}S_2^+$	339
$C_8H_{12}Si^+$	297
$C_8H_{13}^+$	79
$C_8H_{13}N^+$	137
$C_8H_{13}NO^+$	233
$C_8H_{13}NOGe^+$	451
$C_8H_{13}NOSi^+$	307
$C_8H_{13}NOSn^+$	501
$C_8H_{13}NO_2^+$	250
$C_8H_{13}NSi^+$	303
$C_8H_{13}OSMn^+$	426
$C_8H_{13}P^+$	312
$C_8H_{14}^+$	80
$C_8H_{14}CrGe^+$	453
$C_8H_{14}N^+$	137
$C_8H_{14}NBr^+$	468
$C_8H_{14}NCl^+$	379
$C_8H_{14}N_2^+$	154
$C_8H_{14}N_2O^+$	243
$C_8H_{14}N_2O_2^+$	257
$C_8H_{14}Ni^+$	442
$C_8H_{14}O^+$	194
$C_8H_{14}O_2^+$	213
$C_8H_{14}O_3PCl_1^+$	360
$C_8H_{14}Pd^+$	492
$C_8H_{14}Pt^+$	543
$C_8H_{14}S^+$	334
$C_8H_{14}Si^+$	297
$C_8H_{15}N^+$	138
$C_8H_{15}NO^+$	233
$C_8H_{15}NO_2Cl_2^+$	388
$C_8H_{15}N_3^+$	163
$C_8H_{15}O_3PCr^+$	417
$C_8H_{15}O_5PW^+$	536
$C_8H_{16}^+$	80
$C_8H_{16}NO_2Cl^+$	388
$C_8H_{16}N_2^+$	154
$C_8H_{16}N_2O^+$	243
$C_8H_{16}N_2O_2^+$	257
$C_8H_{16}N_4^+$	165
$C_8H_{16}O^+$	194
$C_8H_{16}OS^+$	355
$C_8H_{16}O_2^+$	213
$C_8H_{16}O_4^+$	223
$C_8H_{17}N^+$	138
$C_8H_{17}NO^+$	233
$C_8H_{17}NO_4Si^+$	307
$C_8H_{18}FP^+$	321
$C_8H_{18}Ge^+$	450
$C_8H_{18}Hg^+$	546
$C_8H_{18}NO^+$	234
$C_8H_{18}N_2^+$	155
$C_8H_{18}N_2O_2^+$	257
$C_8H_{18}N_2S^+$	347
$C_8H_{18}N_3O_2PFe^+$	433
$C_8H_{18}N_3O_2PMo^+$	488
$C_8H_{18}N_3P^+$	316
$C_8H_{18}N_4^+$	165
$C_8H_{18}N_4Ni^+$	444
$C_8H_{18}O^+$	194
$C_8H_{18}OS^+$	355
$C_8H_{18}O_2^+$	213

$C_8H_{18}O_2S^+$	358	$C_9H_8^+$	82
$C_8H_{18}PCl^+$	396	$C_9H_8Cl_2^+$	376
$C_8H_{18}S^+$	334	$C_9H_8DO^+$	195
$C_8H_{18}S_2^+$	339	$C_9H_8NO^+$	234
$C_8H_{18}Si_2Br_2^+$	476	$C_9H_8NOF_3^+$	288
$C_8H_{18}Si_2Cl_2^+$	395	$C_9H_8N_2O^+$	243
$C_8H_{18}Sn^+$	498	$C_9H_8N_2S_2^+$	350
$C_8H_{19}O_2PS_3^+$	370	$C_9H_8O^+$	194
$C_8H_{19}P^+$	312	$C_9H_8OS^+$	356
$C_8H_{20}Ge^+$	450	$C_9H_8O_2^+$	213
$C_8H_{20}NO_1P^+$	320	$C_9H_8O_2Cr^+$	412
$C_8H_{20}N_3^+$	155	$C_9H_8O_2SCr^+$	419
$C_8H_{20}N_3P^+$	316	$C_9H_8O_3Cr^+$	412
$C_8H_{20}N_4^+$	165	$C_9H_8O_3Fe^+$	431
$C_8H_{20}O_3P_2S_3Ni^+$	444	$C_9H_8O_3PMn^+$	424
$C_8H_{20}O_3P_2S_3Pd^+$	492	$C_9H_8O_3Ru^+$	490
$C_8H_{20}O_3P_2S_3Pt^+$	543	$C_9H_8O_4^+$	223
$C_8H_{20}O_3Si^+$	306	$C_9H_8O_5SCr^+$	419
$C_8H_{20}Si^+$	297	$C_9H_9^+$	82
$C_8H_{20}Si_2^+$	299	$C_9H_9Cl^+$	374
$C_8H_{20}Sn^+$	498	$C_9H_9F^+$	278
$C_8H_{21}NSi^+$	303	$C_9H_9N^+$	138
$C_8H_{21}NSi_2^+$	304	$C_9H_9NO^+$	234
$C_8H_{22}O_2Si_2^+$	306	$C_9H_9NOS^+$	362
$C_8H_{22}Si_2^+$	299	$C_9H_9NO_3Cr^+$	414
$C_8H_{22}Si_2Cd^+$	495	$C_9H_9N_3Cl_2^+$	381
$C_8H_{22}Sn^+$	500	$C_9H_9N_3F^+$	282
$C_8H_{23}NSi_2^+$	304	$C_9H_9N_3S^+$	348
$C_8H_{23}N_4Ge^+$	451	$C_9H_9O^+$	195
$C_8H_{23}N_4Hf^+$	531	$C_9H_9O_5^+$	223
$C_8H_{23}N_4Mo^+$	486	$C_9H_{10}^+$	82
$C_8H_{23}N_4Si^+$	304	$C_9H_{10}NO^+$	234
$C_8H_{23}N_4Si_2^+$	304	$C_9H_{10}NOCl^+$	386
$C_8H_{23}N_4Sn^+$	500	$C_9H_{10}N_2Br^+$	469
$C_8H_{23}N_4Ti^+$	406	$C_9H_{10}N_2Cl^+$	380
$C_8H_{23}N_4V^+$	408	$C_9H_{10}N_2F^+$	281
$C_8H_{23}N_4Zr^+$	484	$C_9H_{10}N_2I^+$	512
$C_8H_{23}P_2Pt^+$	543	$C_9H_{10}N_2S^+$	347
$C_8H_{24}Si_4^+$	301	$C_9H_{10}N_3Cl^+$	380
$C_8N_2F_4^+$	280	$C_9H_{10}N_3O_2^+$	260
$C_8N_2F_6^+$	280	$C_9H_{10}N_3O_2Cl^+$	388
$C_8N_2O_2Cl_2^+$	385	$C_9H_{10}O^+$	195
$C_8O_3Cl_4^+$	382	$C_9H_{10}OCr^+$	411
$C_8O_3F_6Co_2^+$	440	$C_9H_{10}O_2^+$	213
$C_8O_3F_{12}Mo_2^+$	487	$C_9H_{10}O_4^+$	221
$C_9H_4O_3^+$	221	$C_9H_{10}O_3Fe^+$	431
$C_9H_5FS_3^+$	366	$C_9H_{10}O_7PCr^+$	417
$C_9H_5NO_4Fe^+$	433	$C_9H_{10}O_7PW^+$	537
$C_9H_5O_3ClCr^+$	420	$C_9H_{10}S^+$	334
$C_9H_5S_3Cl^+$	399	$C_9H_{11}Cl^+$	374
$C_9H_6N_2^+$	155	$C_9H_{11}N^+$	139
$C_9H_6N_2S^+$	347	$C_9H_{11}NO^+$	234
$C_9H_6N_3F_5^+$	283	$C_9H_{11}NO_2^+$	250
$C_9H_6OS^+$	355	$C_9H_{11}NO_3^+$	262
$C_9H_6O_2^+$	213	$C_9H_{11}N_2^+$	155
$C_9H_6O_2S^+$	358	$C_9H_{11}N_2Br^+$	469
$C_9H_6O_3Cr^+$	412	$C_9H_{11}N_2Cl^+$	380
$C_9H_6O_3S^+$	359	$C_9H_{11}N_2F^+$	281
$C_9H_6O_3Co_2^+$	439	$C_9H_{11}N_2I^+$	512
$C_9H_6S_3^+$	341	$C_9H_{11}N_2O^+$	243
$C_9H_7^+$	81	$C_9H_{11}N_2OCl^+$	387
$C_9H_7N^+$	138	$C_9H_{11}N_2OF_2P^+$	324
$C_9H_7NO^+$	234	$C_9H_{11}N_2S^+$	347
$C_9H_7NO_2^+$	250	$C_9H_{11}N_2SCI^+$	400
$C_9H_7NO_2Cr^+$	414	$C_9H_{11}N_3^+$	163
$C_9H_7N_3O_3^+$	264	$C_9H_{11}N_3O_2^+$	260
$C_9H_7O_2SMn^+$	427	$C_9H_{11}O_6^+$	224
$C_9H_7O_3^+$	221	$C_9H_{11}S^+$	334
$C_9H_7O_3Mn^+$	423	$C_9H_{12}^+$	83
$C_9H_7P^+$	312	$C_9H_{12}Cr^+$	410

$C_9H_{12}N_2^+$	156	$C_9H_{18}^+$	86
$C_9H_{12}N_2O^+$	243	$C_9H_{18}NCl^+$	379
$C_9H_{12}N_2O_2^+$	257	$C_9H_{18}NO^+$	235
$C_9H_{12}N_2S^+$	347	$C_9H_{18}NO_2^+$	251
$C_9H_{12}O^+$	195	$C_9H_{18}NO_2Cl^+$	388
$C_9H_{12}OBr^+$	471	$C_9H_{18}N_2^+$	156
$C_9H_{12}O_2^+$	214	$C_9H_{18}N_3O_3PCr^+$	418
$C_9H_{12}O_2S^+$	358	$C_9H_{18}N_3O_3PFe^+$	433
$C_9H_{12}O_3^+$	221	$C_9H_{18}N_3O_3PMo^+$	488
$C_9H_{12}S^+$	334	$C_9H_{18}N_3S_6Fe^+$	435
$C_9H_{13}^+$	85	$C_9H_{18}O^+$	196
$C_9H_{13}As^+$	454	$C_9H_{18}O_3^+$	221
$C_9H_{13}ClGe^+$	453	$C_9H_{18}S_3^+$	341
$C_9H_{13}ClSn^+$	503	$C_9H_{19}N^+$	140
$C_9H_{13}FSi^+$	308	$C_9H_{20}Ge^+$	450
$C_9H_{13}N^+$	139	$C_9H_{20}Hg^+$	546
$C_9H_{13}NFSi^+$	309	$C_9H_{20}N_2^+$	156
$C_9H_{13}NO^+$	234	$C_9H_{20}Sn^+$	498
$C_9H_{13}NO_2^+$	251	$C_9H_{21}N^+$	140
$C_9H_{13}NO_2Si^+$	307	$C_9H_{21}NBr_2^+$	469
$C_9H_{13}NO_3Si^+$	307	$C_9H_{21}NSi^+$	303
$C_9H_{13}NS^+$	345	$C_9H_{21}O_3P^+$	319
$C_9H_{13}OFSi^+$	309	$C_9H_{21}P^+$	312
$C_9H_{13}OSiBr^+$	476	$C_9H_{22}Si^+$	297
$C_9H_{13}OSiCl^+$	395	$C_9H_{22}Sn^+$	498
$C_9H_{13}P^+$	312	$C_9H_{23}O_2Si_2^+$	306
$C_9H_{13}SiBr^+$	476	$C_9H_{24}N_4^+$	165
$C_9H_{13}SiCl^+$	394	$C_9H_{24}Si_2^+$	299
$C_9H_{14}^+$	85	$C_9H_{24}Sn_2^+$	500
$C_9H_{14}F_2Si_2^+$	309	$C_9H_{25}NSi_2^+$	304
$C_9H_{14}Ge^+$	450	$C_9H_{25}Si_2P^+$	325
$C_9H_{14}NO_2^+$	251	$C_9H_{27}NSi_3^+$	304
$C_9H_{14}NP^+$	315	$C_9NF_7^+$	280
$C_9H_{14}NSi^+$	303	$C_9O_5F_6Co_2^+$	440
$C_9H_{14}N_2^+$	156	$C_{10}Cl_6^+$	372
$C_9H_{14}N_2Ge^+$	451	$C_{10}F_8^+$	273
$C_9H_{14}N_2O^+$	243	$C_{10}F_{12}S_3^+$	365
$C_9H_{14}N_2O_3^+$	264	$C_{10}H_2O_4F_{12}Cu^+$	445
$C_9H_{14}N_2S^+$	348	$C_{10}H_2O_4F_{12}Mg^+$	290
$C_9H_{14}N_2Si^+$	304	$C_{10}H_2O_4F_{12}Ni^+$	444
$C_9H_{14}O^+$	195	$C_{10}H_2O_4F_{12}Zn^+$	447
$C_9H_{14}OCrGe^+$	453	$C_{10}H_2O_6^+$	224
$C_9H_{14}OS^+$	356	$C_{10}H_2O_6F_{12}U^+$	555
$C_9H_{14}OSi^+$	305	$C_{10}H_4NO_3ClCr^+$	420
$C_9H_{14}O_2^+$	214	$C_{10}H_4NO_3CrBr^+$	480
$C_9H_{14}Pb^+$	550	$C_{10}H_4O_6Cl_2Co_2^+$	441
$C_9H_{14}SGe^+$	452	$C_{10}H_5NO_3Cr^+$	414
$C_9H_{14}SPb^+$	551	$C_{10}H_5NO_3W^+$	535
$C_9H_{14}SSn^+$	501	$C_{10}H_5NO_6Cr^+$	415
$C_9H_{14}Si^+$	297	$C_{10}H_6^+$	86
$C_9H_{14}SiS^+$	367	$C_{10}H_6Br_2^+$	467
$C_9H_{14}Si_2Cl_2^+$	395	$C_{10}H_6Cl_2^+$	376
$C_9H_{14}Sn^+$	498	$C_{10}H_6N_2^+$	156
$C_9H_{15}N^+$	139	$C_{10}H_6O_2^+$	214
$C_9H_{15}NO^+$	234	$C_{10}H_6O_3^+$	221
$C_9H_{15}NO_2^+$	251	$C_{10}H_6O_4^+$	223
$C_9H_{15}N_2O_2^+$	257	$C_{10}H_6O_6Co_2^+$	439
$C_9H_{15}O_6PCr^+$	417	$C_{10}H_6S_2^+$	339
$C_9H_{15}O_6PW^+$	537	$C_{10}H_7N^+$	140
$C_9H_{16}^+$	85	$C_{10}H_7NO_2^+$	251
$C_9H_{16}NOCl^+$	386	$C_{10}H_7O_3Mn^+$	423
$C_9H_{16}NO_2^+$	251	$C_{10}H_8^+$	86
$C_9H_{16}N_2^+$	156	$C_{10}H_8^{+2}$	87
$C_9H_{16}O^+$	196	$C_{10}H_8^{+3}$	87
$C_9H_{17}N^+$	140	$C_{10}H_8Cl_3Fe^+$	436
$C_9H_{17}NO^+$	235	$C_{10}H_8F_6S_4Ni^+$	444
$C_9H_{17}NO_2^+$	251	$C_{10}H_8N_2^+$	156
$C_9H_{17}NO_2Cl_2^+$	388	$C_{10}H_8N_2O_2^+$	257
$C_9H_{17}NO_2S^+$	364	$C_{10}H_8O^+$	196
$C_9H_{17}N_2O_2^+$	257	$C_{10}H_8OS_2^+$	360

$C_{10}H_8OS_3^+$	360
$C_{10}H_8O_2^+$	214
$C_{10}H_8O_2F_6S_2Ni^+$	444
$C_{10}H_8O_3Cr^+$	412
$C_{10}H_8O_3Fe^+$	431
$C_{10}H_8O_3Mo^+$	486
$C_{10}H_8O_3W^+$	534
$C_{10}H_8O_4Cr^+$	413
$C_{10}H_8O_4F_6Co^+$	440
$C_{10}H_8O_4F_6Cu^+$	445
$C_{10}H_8O_4F_6Ni^+$	443
$C_{10}H_8O_8Fe^+$	432
$C_{10}H_8S^+$	334
$C_{10}H_8S_3^+$	341
$C_{10}H_9ClFe^+$	436
$C_{10}H_9N^+$	140
$C_{10}H_9NO^+$	235
$C_{10}H_9NO_6SFe_2^+$	436
$C_{10}H_9NS^+$	345
$C_{10}H_9O_3Mn^+$	423
$C_{10}H_9P^+$	312
$C_{10}H_{10}^+$	87
$C_{10}H_{10}Br_2Ta^+$	532
$C_{10}H_{10}Br_2Zr^+$	484
$C_{10}H_{10}Cl_2Hf^+$	531
$C_{10}H_{10}Cl_2Ta^+$	532
$C_{10}H_{10}Cl_2Ti^+$	407
$C_{10}H_{10}Cl_2Zr^+$	484
$C_{10}H_{10}Co^+$	437
$C_{10}H_{10}Cr^+$	410
$C_{10}H_{10}F_3Ti^+$	407
$C_{10}H_{10}Fe^+$	429
$C_{10}H_{10}Hg^+$	547
$C_{10}H_{10}La^+$	522
$C_{10}H_{10}Mg^+$	290
$C_{10}H_{10}Mn^+$	421
$C_{10}H_{10}NO^+$	235
$C_{10}H_{10}NOF_3^+$	288
$C_{10}H_{10}N_2^+$	156
$C_{10}H_{10}N_2Cl_2^+$	381
$C_{10}H_{10}N_2O_4^+$	264
$C_{10}H_{10}Nd^+$	525
$C_{10}H_{10}Ni^+$	442
$C_{10}H_{10}O^+$	196
$C_{10}H_{10}O_2^+$	214
$C_{10}H_{10}O_2Cr^+$	412
$C_{10}H_{10}O_2Fe^+$	431
$C_{10}H_{10}O_3Fe^+$	431
$C_{10}H_{10}O_3Ru^+$	490
$C_{10}H_{10}Pb^+$	550
$C_{10}H_{10}Pr^+$	524
$C_{10}H_{10}Ru^+$	490
$C_{10}H_{10}Si^+$	297
$C_{10}H_{10}Sn^+$	498
$C_{10}H_{10}TiBr_2^+$	480
$C_{10}H_{10}V^+$	407
$C_{10}H_{10}W_2^+$	533
$C_{10}H_{10}ZrI_2^+$	518
$C_{10}H_{11}Cl^+$	374
$C_{10}H_{11}DO^+$	197
$C_{10}H_{11}N^+$	140
$C_{10}H_{11}NO^+$	235
$C_{10}H_{11}NO_4^+$	265
$C_{10}H_{11}NO_5Cr^+$	414
$C_{10}H_{11}NO_5W^+$	535
$C_{10}H_{11}N_3^+$	163
$C_{10}H_{11}N_3S^+$	349
$C_{10}H_{11}O^+$	196
$C_{10}H_{11}O_5SMn^+$	427
$C_{10}H_{11}Re^+$	540

$C_{10}H_{12}^+$	88
$C_{10}H_{12}Mo^+$	485
$C_{10}H_{12}NO^+$	235
$C_{10}H_{12}NOCl^+$	386
$C_{10}H_{12}N_2^+$	156
$C_{10}H_{12}O^+$	196
$C_{10}H_{12}OCr^+$	411
$C_{10}H_{12}O_4^+$	214
$C_{10}H_{12}S_2^+$	339
$C_{10}H_{12}S_3^+$	341
$C_{10}H_{12}S^+$	342
$C_{10}H_{12}Se_4^+$	459
$C_{10}H_{12}W^+$	533
$C_{10}H_{13}Cl^+$	374
$C_{10}H_{13}F^+$	275
$C_{10}H_{13}N^+$	140
$C_{10}H_{13}NO^+$	235
$C_{10}H_{13}NO_2^+$	251
$C_{10}H_{13}N_2^+$	157
$C_{10}H_{13}N_2Cl^+$	380
$C_{10}H_{13}N_2O^+$	243
$C_{10}H_{13}N_2OCl^+$	387
$C_{10}H_{13}N_2OF_2P^+$	324
$C_{10}H_{13}N_2S^+$	348
$C_{10}H_{13}N_2SCl^+$	400
$C_{10}H_{13}N_3^+$	163
$C_{10}H_{13}O_5SMn^+$	427
$C_{10}H_{13}P^+$	312
$C_{10}H_{13}Ta^+$	532
$C_{10}H_{14}^+$	89
$C_{10}H_{14}Ge^+$	450
$C_{10}H_{14}N^+$	140
$C_{10}H_{14}NOCl^+$	386
$C_{10}H_{14}N_2^+$	157
$C_{10}H_{14}N_2O^+$	244
$C_{10}H_{14}N_2S^+$	348
$C_{10}H_{14}O^+$	197
$C_{10}H_{14}OBr^+$	471
$C_{10}H_{14}OSi^+$	305
$C_{10}H_{14}O_2^+$	214
$C_{10}H_{14}O_2CrGe^+$	453
$C_{10}H_{14}O_2S_2Co^+$	440
$C_{10}H_{14}O_2S_2Cu^+$	445
$C_{10}H_{14}O_2S_2Ni^+$	444
$C_{10}H_{14}O_3^+$	221
$C_{10}H_{14}O_4Cl_2Sn^+$	503
$C_{10}H_{14}O_4Co^+$	438
$C_{10}H_{14}O_4Cu^+$	445
$C_{10}H_{14}O_4Mg^+$	290
$C_{10}H_{14}O_4Ni^+$	443
$C_{10}H_{14}O_4Zn^+$	447
$C_{10}H_{14}O_6U^+$	554
$C_{10}H_{15}S^+$	335
$C_{10}H_{15}S_4Co^+$	440
$C_{10}H_{15}S_4Ni^+$	444
$C_{10}H_{15}Si^+$	297
$C_{10}H_{15}^+$	90
$C_{10}H_{15}Br^+$	466
$C_{10}H_{15}Cl^+$	374
$C_{10}H_{15}F^+$	276
$C_{10}H_{15}N^+$	140
$C_{10}H_{15}NO^+$	235
$C_{10}H_{15}NO_2^+$	251
$C_{10}H_{15}OSMn^+$	426
$C_{10}H_{15}O_7PCr^+$	417
$C_{10}H_{15}O_7PW^+$	537
$C_{10}H_{15}P^+$	312
$C_{10}H_{15}SMn^+$	425
$C_{10}H_{16}^+$	90
$C_{10}H_{16}Ge^+$	450

$C_{10}H_{16}NFSi^+$	309
$C_{10}H_{16}NP^+$	315
$C_{10}H_{16}N_2^+$	157
$C_{10}H_{16}N_2O_2^+$	257
$C_{10}H_{16}N_4^+$	166
$C_{10}H_{16}O^+$	197
$C_{10}H_{16}OSi^+$	305
$C_{10}H_{16}O_2^+$	215
$C_{10}H_{16}O_2S^+$	358
$C_{10}H_{16}O_2Si^+$	306
$C_{10}H_{16}O_3^+$	222
$C_{10}H_{16}O_3Ni^+$	443
$C_{10}H_{16}O_3Pd^+$	492
$C_{10}H_{16}O_3Pt^+$	543
$C_{10}H_{16}P_2^+$	314
$C_{10}H_{16}Pb^+$	550
$C_{10}H_{16}S^+$	335
$C_{10}H_{16}SGe^+$	452
$C_{10}H_{16}SPb^+$	551
$C_{10}H_{16}SSn^+$	501
$C_{10}H_{16}S_4^+$	342
$C_{10}H_{16}Si^+$	297
$C_{10}H_{16}SiS^+$	367
$C_{10}H_{16}Sn^+$	499
$C_{10}H_{17}^+$	91
$C_{10}H_{17}FSi_2^+$	309
$C_{10}H_{17}N^+$	141
$C_{10}H_{17}NO^+$	235
$C_{10}H_{17}NO_2^+$	252
$C_{10}H_{17}OCl^+$	384
$C_{10}H_{17}P^+$	312
$C_{10}H_{17}Si_2Cl^+$	395
$C_{10}H_{18}^+$	91
$C_{10}H_{18}N_2^+$	157
$C_{10}H_{18}N_2O^+$	244
$C_{10}H_{18}N_2O_2^+$	257
$C_{10}H_{18}N_3O^+$	266
$C_{10}H_{18}N_3O_4PCr^+$	418
$C_{10}H_{18}N_3O_4PFe^+$	433
$C_{10}H_{18}N_3O_4PMo^+$	488
$C_{10}H_{18}Ni^+$	442
$C_{10}H_{18}O^+$	197
$C_{10}H_{18}O_2^+$	215
$C_{10}H_{18}S_6^+$	342
$C_{10}H_{18}Si_2^+$	299
$C_{10}H_{18}Sn^+$	499
$C_{10}H_{19}N^+$	141
$C_{10}H_{19}NO^+$	236
$C_{10}H_{19}NO_2Cl_2^+$	388
$C_{10}H_{20}^+$	91
$C_{10}H_{20}NO_2Cl^+$	388
$C_{10}H_{20}N_2^+$	157
$C_{10}H_{20}N_4^+$	166
$C_{10}H_{20}O^+$	197
$C_{10}H_{20}O_2^+$	224
$C_{10}H_{20}S^+$	335
$C_{10}H_{21}P^+$	312
$C_{10}H_{22}Hg^+$	547
$C_{10}H_{22}N_2^+$	157
$C_{10}H_{22}N_2O^+$	244
$C_{10}H_{22}Si_2^+$	299
$C_{10}H_{23}N^+$	141
$C_{10}H_{23}N_2^+$	157
$C_{10}H_{24}N_2S_2Sn_2^+$	502
$C_{10}H_{24}N_3P^+$	316
$C_{10}H_{24}N_4^+$	166
$C_{10}H_{24}O_3Ti^+$	406
$C_{10}H_{24}O_4Ti^+$	406
$C_{10}H_{24}Si_2^+$	299
$C_{10}H_{24}Si_4^+$	302

$C_{10}H_{24}Sn^+$	499
$C_{10}H_{25}O_2Si_2^+$	306
$C_{10}H_{25}P_5^+$	315
$C_{10}H_{27}NSi_2^+$	304
$C_{10}H_{27}Si_2As^+$	456
$C_{10}H_{27}Si_2P^+$	325
$C_{10}H_{28}N_2Si_2^+$	304
$C_{10}H_{30}N_3Nb^+$	485
$C_{10}H_{30}N_3Ta^+$	532
$C_{10}H_{30}Si^+$	302
$C_{10}H_{30}Si_5^+$	302
$C_{10}O_6F_6Co_2^+$	440
$C_{10}O_{10}Mn_2^+$	422
$C_{10}O_{10}Re_2^+$	541
$C_{11}HO_3F_{23}^+$	287
$C_{11}H_2N_2O_5W^+$	535
$C_{11}H_5N_3^+$	163
$C_{11}H_6O_7Cr^+$	413
$C_{11}H^+$	92
$C_{11}H_7N^+$	141
$C_{11}H_7NO_5Cr^+$	414
$C_{11}H_7NO_5W^+$	535
$C_{11}H_7NO_6Cr^+$	415
$C_{11}H_8N_2^+$	158
$C_{11}H_8N_2O^+$	244
$C_{11}H_8O^+$	198
$C_{11}H_8OS^+$	356
$C_{11}H_8O_2^+$	215
$C_{11}H_8O_3Fe^+$	432
$C_{11}H_8O_4Cr^+$	413
$C_{11}H_8O_4Mo^+$	486
$C_{11}H_8O_4Scr^+$	419
$C_{11}H_8O_5Cr^+$	413
$C_{11}H_9^+$	92
$C_{11}H_9F^+$	276
$C_{11}H_9I^+$	511
$C_{11}H_9NO^+$	252
$C_{11}H_{10}^+$	92
$C_{11}H_{10}O^+$	198
$C_{11}H_{10}OMo^+$	486
$C_{11}H_{10}OW_2^+$	535
$C_{11}H_{10}O_2^+$	215
$C_{11}H_{10}O_2S^+$	358
$C_{11}H_{10}O_3Cr^+$	412
$C_{11}H_{10}O_4PMn^+$	424
$C_{11}H_{10}S^+$	335
$C_{11}H_{10}SFe_2^+$	435
$C_{11}H_{10}SMn_2^+$	426
$C_{11}H_{11}Cr^+$	410
$C_{11}H_{11}Mn^+$	421
$C_{11}H_{11}N^+$	141
$C_{11}H_{11}NOS^+$	362
$C_{11}H_{11}NO_2^+$	252
$C_{11}H_{11}NO_3Cr^+$	414
$C_{11}H_{11}^+$	93
$C_{11}H_{12}N_2Cl_2^+$	381
$C_{11}H_{12}N_2O_2^+$	257
$C_{11}H_{12}O^+$	198
$C_{11}H_{12}O_2^+$	215
$C_{11}H_{12}O_2Cr^+$	412
$C_{11}H_{12}O_3Fe^+$	432
$C_{11}H_{12}O_3PMn^+$	424
$C_{11}H_{12}O_4Fe^+$	432
$C_{11}H_{12}O_5Fe^+$	432
$C_{11}H_{13}Cl^+$	374
$C_{11}H_{13}DO^+$	198
$C_{11}H_{13}N^+$	141
$C_{11}H_{13}NO^+$	236
$C_{11}H_{13}N_3Cl_2^+$	381
$C_{11}H_{13}O^+$	198

$C_{11}H_{13}O_7^+$	224
$C_{11}H_{14}^+$	93
$C_{11}H_{13}NO^+$	236
$C_{11}H_{13}NOCl^+$	386
$C_{11}H_{13}N_2^+$	158
$C_{11}H_{13}N_2O^+$	244
$C_{11}H_{14}O^+$	198
$C_{11}H_{14}O_2^+$	215
$C_{11}H_{14}O_3CrGe^+$	453
$C_{11}H_{15}Cl^+$	374
$C_{11}H_{15}NO^+$	236
$C_{11}H_{15}N_2O^+$	244
$C_{11}H_{15}N_2OCl^+$	387
$C_{11}H_{15}N_2S^+$	348
$C_{11}H_{15}N_2SCl^+$	400
$C_{11}H_{15}N_3^+$	163
$C_{11}H_{15}N_5^+$	167
$C_{11}H_{15}O_3PCr^+$	417
$C_{11}H_{15}O_3PMo^+$	488
$C_{11}H_{15}O_3PW^+$	536
$C_{11}H_{15}O_8PCr^+$	418
$C_{11}H_{15}O_8PMo^+$	488
$C_{11}H_{15}O_8PW^+$	537
$C_{11}H_{16}^+$	94
$C_{11}H_{16}NO_2Br^+$	473
$C_{11}H_{16}NO_2F_3^+$	288
$C_{11}H_{16}N_2O^+$	244
$C_{11}H_{16}N_2S^+$	348
$C_{11}H_{16}N_3^+$	163
$C_{11}H_{16}N_3Cl^+$	380
$C_{11}H_{16}O^+$	198
$C_{11}H_{16}OBr^+$	471
$C_{11}H_{16}O_2^+$	215
$C_{11}H_{16}S^+$	335
$C_{11}H_{16}Si^+$	297
$C_{11}H_{17}^+$	94
$C_{11}H_{17}N^+$	142
$C_{11}H_{17}NO^+$	252
$C_{11}H_{17}NO_3^+$	262
$C_{11}H_{17}N_3^+$	163
$C_{11}H_{17}O_3PCr^+$	417
$C_{11}H_{18}^+$	94
$C_{11}H_{18}N_3O_3PCr^+$	418
$C_{11}H_{18}N_3O_3PMo^+$	488
$C_{11}H_{18}N_3O_3PW^+$	537
$C_{11}H_{18}O^+$	198
$C_{11}H_{18}O_2^+$	216
$C_{11}H_{18}SSn^+$	501
$C_{11}H_{18}SiS^+$	367
$C_{11}H_{19}N^+$	142
$C_{11}H_{19}NOSi^+$	307
$C_{11}H_{20}^+$	95
$C_{11}H_{20}NO^+$	236
$C_{11}H_{20}N_2O_4^+$	266
$C_{11}H_{20}O^+$	199
$C_{11}H_{20}OSi_2^+$	306
$C_{11}H_{20}O_2^+$	216
$C_{11}H_{20}O_2Si_2^+$	306
$C_{11}H_{20}O_3Si_2^+$	306
$C_{11}H_{20}PAu^+$	545
$C_{11}H_{20}Si_2^+$	299
$C_{11}H_{21}N^+$	142
$C_{11}H_{21}NSi_2^+$	304
$C_{11}H_{21}N_2O_2^+$	258
$C_{11}H_{22}^+$	95
$C_{11}H_{22}NO^+$	236
$C_{11}H_{22}N_2^+$	158
$C_{11}H_{22}O^+$	199
$C_{11}H_{22}Si_2^+$	299
$C_{11}H_{23}P^+$	312

$C_{11}H_{24}S_2Sn^+$	502
$C_{11}H_{25}NS_2Sn^+$	502
$C_{11}H_{27}O_2Si_2^+$	306
$C_{11}H_{31}NSi_3P_2^+$	325
$C_{12}F_8^+$	273
$C_{12}F_{10}^+$	273
$C_{12}H_3O_{12}Re_3^+$	541
$C_{12}H_4^+$	95
$C_{12}H_6N_4^+$	166
$C_{12}H_6O_2^+$	216
$C_{12}H_6O_3^+$	222
$C_{12}H_7NO_2^+$	252
$C_{12}H_7NO_3Cr^+$	414
$C_{12}H_7NO_6Cr^+$	415
$C_{12}H_7N_2OCl^+$	387
$C_{12}H_7N_3^+$	163
$C_{12}H_7N_3O_3^+$	265
$C_{12}H_8^+$	95
$C_{12}H_8Br_2^+$	467
$C_{12}H_8FBr^+$	474
$C_{12}H_8F_2^+$	277
$C_{12}H_8NO^+$	236
$C_{12}H_8NOBr^+$	472
$C_{12}H_8NOCl^+$	386
$C_{12}H_8NOF^+$	287
$C_{12}H_8NOI^+$	513
$C_{12}H_8N_2^+$	158
$C_{12}H_8N_2O^+$	244
$C_{12}H_8N_2O_4^+$	264
$C_{12}H_8N_3^+$	163
$C_{12}H_8N_3Cl^+$	380
$C_{12}H_8O^+$	199
$C_{12}H_8OS^+$	356
$C_{12}H_8OSe^+$	461
$C_{12}H_8OTe^+$	507
$C_{12}H_8O_2^+$	216
$C_{12}H_8O_2S^+$	358
$C_{12}H_8O_2SBr_2^+$	479
$C_{12}H_8S^+$	335
$C_{12}H_8SCl_2^+$	400
$C_{12}H_9^+$	96
$C_{12}H_9Br^+$	466
$C_{12}H_9Cl^+$	374
$C_{12}H_9F^+$	276
$C_{12}H_9I^+$	511
$C_{12}H_9N^+$	142
$C_{12}H_9NO^+$	236
$C_{12}H_9NO_3W^+$	535
$C_{12}H_9NS^+$	345
$C_{12}H_9N_2Cl^+$	380
$C_{12}H_9N_3^+$	163
$C_{12}H_9N_3O_2^+$	260
$C_{12}H_9N_3O_2F^+$	288
$C_{12}H_9O_4Rh^+$	491
$C_{12}H_9SCl^+$	399
$C_{12}H_{10}^+$	96
$C_{12}H_{10}^{+2}$	96
$C_{12}H_{10}As^+$	454
$C_{12}H_{10}Bi^+$	552
$C_{12}H_{10}Ga^+$	448
$C_{12}H_{10}Hg^+$	546
$C_{12}H_{10}NOS_2Mn_2^+$	428
$C_{12}H_{10}N_2^+$	158
$C_{12}H_{10}N_2O^+$	244
$C_{12}H_{10}N_2O_2^+$	258
$C_{12}H_{10}N_2O_2S_2Mn^+$	8
$C_{12}H_{10}N_3F_4P_4^+$	323
$C_{12}H_{10}N_4O_2^+$	261
$C_{12}H_{10}O^+$	199
$C_{12}H_{10}OS^+$	356

$C_{12}H_{10}OSFe_2^+$	435
$C_{12}H_{10}O_2Fe^+$	431
$C_{12}H_{10}O_2S^+$	359
$C_{12}H_{10}O_2Ti^+$	406
$C_{12}H_{10}O_2W_2^+$	535
$C_{12}H_{10}S^+$	335
$C_{12}H_{10}S_2Fe_2^+$	435
$C_{12}H_{10}S_2Mn_2^+$	426
$C_{12}H_{10}Sb^+$	505
$C_{12}H_{10}Si_2^+$	300
$C_{12}H_{11}^+$	96
$C_{12}H_{11}As^+$	455
$C_{12}H_{11}N^+$	142
$C_{12}H_{11}NO^+$	237
$C_{12}H_{11}NO_2^+$	252
$C_{12}H_{11}N_3^+$	163
$C_{12}H_{11}P^+$	312
$C_{12}H_{12}^+$	96
$C_{12}H_{12}Cr^+$	410
$C_{12}H_{12}Fe^+$	429
$C_{12}H_{12}Mo^+$	485
$C_{12}H_{12}N_2^+$	158
$C_{12}H_{12}N_2O^+$	244
$C_{12}H_{12}N_2O_2S^+$	364
$C_{12}H_{12}N_3S^+$	348
$C_{12}H_{12}Nb^+$	485
$C_{12}H_{12}O^+$	200
$C_{12}H_{12}OS^+$	356
$C_{12}H_{12}O_2^+$	216
$C_{12}H_{12}O_3S^+$	359
$C_{12}H_{12}O_3Cr^+$	412
$C_{12}H_{12}O_3Mo^+$	486
$C_{12}H_{12}O_3W^+$	534
$C_{12}H_{12}S_2^+$	339
$C_{12}H_{12}Si^+$	297
$C_{12}H_{12}Ti^+$	406
$C_{12}H_{12}V^+$	407
$C_{12}H_{12}Zr^+$	484
$C_{12}H_{13}As^+$	455
$C_{12}H_{13}N^+$	142
$C_{12}H_{13}NO^+$	237
$C_{12}H_{13}NO_2^+$	252
$C_{12}H_{13}NS_2^+$	349
$C_{12}H_{13}N_3^+$	163
$C_{12}H_{13}P^+$	312
$C_{12}H_{14}^+$	97
$C_{12}H_{14}Br_2Mo^+$	490
$C_{12}H_{14}Cl_2Mo^+$	489
$C_{12}H_{14}Cl_2Nb^+$	485
$C_{12}H_{14}Co^+$	437
$C_{12}H_{14}Cr^+$	410
$C_{12}H_{14}Fe^+$	430
$C_{12}H_{14}Mg^+$	290
$C_{12}H_{14}Mn^+$	421
$C_{12}H_{14}Mo^+$	485
$C_{12}H_{14}MoI^+$	515
$C_{12}H_{14}NO_2^+$	252
$C_{12}H_{14}N_2^+$	159
$C_{12}H_{14}N_2O_3Cr^+$	415
$C_{12}H_{14}N_2O_5Mo^+$	487
$C_{12}H_{14}N_2O_5W^+$	535
$C_{12}H_{14}Ni^+$	442
$C_{12}H_{14}O^+$	200
$C_{12}H_{14}O_2^+$	216
$C_{12}H_{14}O_2S_2Fe_2^+$	436
$C_{12}H_{14}Os^+$	542
$C_{12}H_{14}Ru^+$	490
$C_{12}H_{14}V^+$	407
$C_{12}H_{14}W^+$	533
$C_{12}H_{15}Cl^+$	375

$C_{12}H_{15}DO^+$	200
$C_{12}H_{15}N^+$	142
$C_{12}H_{15}NO^+$	237
$C_{12}H_{15}O_2SMn^+$	427
$C_{12}H_{15}O_3SMn^+$	427
$C_{12}H_{16}^+$	97
$C_{12}H_{16}Mo^+$	485
$C_{12}H_{16}NO^+$	237
$C_{12}H_{16}NOCl^+$	386
$C_{12}H_{16}NS^+$	345
$C_{12}H_{16}NSCl^+$	400
$C_{12}H_{16}N_2^+$	159
$C_{12}H_{16}N_2O_4S_1Fe^+$	436
$C_{12}H_{16}O^+$	200
$C_{12}H_{16}OS^+$	356
$C_{12}H_{16}O_2^+$	216
$C_{12}H_{16}O_3S^+$	359
$C_{12}H_{16}S_3^+$	341
$C_{12}H_{16}Si^+$	298
$C_{12}H_{16}Sn^+$	499
$C_{12}H_{16}W^+$	533
$C_{12}H_{17}P^+$	312
$C_{12}H_{18}^+$	98
$C_{12}H_{18}Cr^+$	410
$C_{12}H_{18}Ge^+$	450
$C_{12}H_{18}NO^+$	237
$C_{12}H_{18}N_2O_2Cu^+$	445
$C_{12}H_{18}N_2O_2Ni^+$	443
$C_{12}H_{18}N_2O_2Pd^+$	492
$C_{12}H_{18}N_2S_2Co^+$	440
$C_{12}H_{18}N_2S_2Cu^+$	445
$C_{12}H_{18}N_2S_2Ni^+$	444
$C_{12}H_{18}N_2S_2Pd^+$	492
$C_{12}H_{18}O^+$	200
$C_{12}H_{18}OBr^+$	471
$C_{12}H_{18}OS^+$	356
$C_{12}H_{18}O_2^+$	216
$C_{12}H_{18}S^+$	335
$C_{12}H_{18}Si^+$	298
$C_{12}H_{18}Sn^+$	499
$C_{12}H_{19}NO_2^+$	252
$C_{12}H_{19}NO_2S^+$	363
$C_{12}H_{19}NO_3^+$	262
$C_{12}H_{20}^+$	98
$C_{12}H_{20}NO^+$	237
$C_{12}H_{20}N_2^+$	159
$C_{12}H_{20}N_2O_2^+$	258
$C_{12}H_{20}N_2S^+$	348
$C_{12}H_{20}N_2S_2^+$	350
$C_{12}H_{20}O^+$	200
$C_{12}H_{20}O_2S^+$	359
$C_{12}H_{20}O_3Sn^+$	501
$C_{12}H_{20}O_8Cr_2^+$	413
$C_{12}H_{20}S^+$	336
$C_{12}H_{20}S_4^+$	342
$C_{12}H_{21}NO^+$	237
$C_{12}H_{22}^+$	99
$C_{12}H_{22}NO^+$	237
$C_{12}H_{22}NO_2^+$	252
$C_{12}H_{22}N_2^+$	159
$C_{12}H_{22}O^+$	200
$C_{12}H_{22}OSi_2^+$	306
$C_{12}H_{22}O_2^+$	216
$C_{12}H_{22}O_3^+$	222
$C_{12}H_{22}Si_3^+$	300
$C_{12}H_{23}N^+$	143
$C_{12}H_{23}NO_2Cl_2^+$	388
$C_{12}H_{24}^+$	99
$C_{12}H_{24}NO^+$	237
$C_{12}H_{24}O_2^+$	216

$C_{12}H_{24}O_7^+$	223	$C_{13}H_{10}NO_2^+$	253
$C_{12}H_{24}O_8^+$	224	$C_{13}H_{10}N_2^+$	159
$C_{12}H_{24}Si_2^+$	300	$C_{13}H_{10}N_2O^+$	244
$C_{12}H_{25}NO^+$	238	$C_{13}H_{10}N_2O_2^+$	258
$C_{12}H_{25}N_2^+$	159	$C_{13}H_{10}N_2O_4^+$	266
$C_{12}H_{26}N_1^+$	166	$C_{13}H_{10}O^+$	201
$C_{12}H_{27}N^+$	143	$C_{13}H_{10}OS_2Fe_2^+$	435
$C_{12}H_{27}NBr_2^+$	469	$C_{13}H_{10}O_2^+$	216
$C_{12}H_{27}O_3PS^+$	369	$C_{13}H_{10}O_2SFe_2^+$	435
$C_{12}H_{27}P^+$	313	$C_{13}H_{10}O_3W_2^+$	535
$C_{12}H_{27}PCr^+$	416	$C_{13}H_{10}S^+$	336
$C_{12}H_{28}N_2^+$	159	$C_{13}H_{11}^+$	100
$C_{12}H_{28}N_3^+$	166	$C_{13}H_{11}N^+$	143
$C_{12}H_{28}Si_2^+$	300	$C_{13}H_{11}NO^+$	238
$C_{12}H_{28}Sn^+$	499	$C_{13}H_{11}NO_2^+$	253
$C_{12}H_{29}O_2Si_2^+$	306	$C_{13}H_{11}NS^+$	345
$C_{12}H_{30}O_4P_3S_6Co^+$	440	$C_{13}H_{11}N_4O_2^+$	261
$C_{12}H_{30}O_4P_3S_3Cr^+$	419	$C_{13}H_{11}O^+$	201
$C_{12}H_{30}O_4P_3S_3In^+$	496	$C_{13}H_{11}OCl^+$	384
$C_{12}H_{30}O_4P_3S_3Rh^+$	492	$C_{13}H_{11}OSCl^+$	401
$C_{12}H_{30}Si_3^+$	300	$C_{13}H_{11}OSi^+$	305
$C_{12}H_{32}P_2S_3Sn_2^+$	502	$C_{13}H_{11}OSn^+$	500
$C_{12}H_{33}NSi_3^+$	304	$C_{13}H_{11}O_2SSn^+$	502
$C_{12}H_{36}N_2Si^+$	304	$C_{13}H_{11}SGe^+$	452
$C_{12}H_{36}N_2Si_4Ge^+$	452	$C_{13}H_{11}SSn^+$	501
$C_{12}H_{36}N_2Si_4Hg^+$	547	$C_{13}H_{11}SiS^+$	368
$C_{12}H_{36}N_2Si_4Pb^+$	551	$C_{13}H_{12}^+$	100
$C_{12}H_{36}N_2Si_4Sn^+$	501	$C_{13}H_{12}N^+$	144
$C_{12}H_{36}N_2Si_4Zn^+$	447	$C_{13}H_{12}NO_2^+$	253
$C_{12}H_{36}N_6Mo_3^+$	486	$C_{13}H_{12}N_2^+$	159
$C_{12}H_{36}N_6P_2Fe^+$	433	$C_{13}H_{12}N_2O^+$	244
$C_{12}H_{36}N_6P_2Mo^+$	488	$C_{13}H_{12}N_2O_2^+$	258
$C_{12}H_{36}N_6P_2W^+$	536	$C_{13}H_{12}N_4O_2^+$	261
$C_{12}H_{36}N_6W^+$	533	$C_{13}H_{12}O^+$	201
$C_{12}H_{36}Si_5^+$	302	$C_{13}H_{12}OS^+$	356
$C_{12}H_{36}Si_6^+$	302	$C_{13}H_{12}O_2^+$	216
$C_{12}O_{12}Os_3^+$	543	$C_{13}H_{12}S^+$	336
$C_{12}O_{12}Ru_3^+$	490	$C_{13}H_{13}N^+$	144
$C_{13}H_7N_3O^+$	246	$C_{13}H_{13}NO^+$	238
$C_{13}H_7N_4^+$	166	$C_{13}H_{13}NO_2S^+$	363
$C_{13}H_7O_6ClCr^+$	420	$C_{13}H_{13}Si^+$	298
$C_{13}H_7O_6FCr^+$	415	$C_{13}H_{13}Ti^+$	406
$C_{13}H_8NO_2^+$	252	$C_{13}H_{14}^+$	101
$C_{13}H_8N_2^+$	159	$C_{13}H_{14}NO_2^+$	253
$C_{13}H_8N_4^+$	166	$C_{13}H_{14}N_2^+$	159
$C_{13}H_9O^+$	200	$C_{13}H_{14}N_2O^+$	245
$C_{13}H_9OS^+$	356	$C_{13}H_{14}N_2O_4^+$	266
$C_{13}H_9O_2^+$	216	$C_{13}H_{14}O_2^+$	217
$C_{13}H_9O_6Cr^+$	413	$C_{13}H_{14}Si^+$	298
$C_{13}H_9S^+$	336	$C_{13}H_{15}Ge^+$	450
$C_{13}H_9^+$	99	$C_{13}H_{15}NO^+$	238
$C_{13}H_9D_2^+$	100	$C_{13}H_{15}NO_2^+$	253
$C_{13}H_9N^+$	143	$C_{13}H_{15}NO_2S^+$	364
$C_{13}H_9NO^+$	238	$C_{13}H_{15}Nb^+$	485
$C_{13}H_9NOS^+$	362	$C_{13}H_{16}^+$	101
$C_{13}H_9NO_2^+$	252	$C_{13}H_{16}N_2^+$	159
$C_{13}H_9NO_2S^+$	363	$C_{13}H_{16}Si^+$	298
$C_{13}H_9NO_3^+$	263	$C_{13}H_{16}Sn^+$	499
$C_{13}H_9NO_4^+$	265	$C_{13}H_{16}W^+$	533
$C_{13}H_9O^+$	201	$C_{13}H_{17}Cl^+$	375
$C_{13}H_9OCl^+$	384	$C_{13}H_{17}N^+$	144
$C_{13}H_9P^+$	313	$C_{13}H_{17}NO_2S^+$	364
$C_{13}H_{10}^+$	100	$C_{13}H_{17}N_3^+$	164
$C_{13}H_{10}D^+$	100	$C_{13}H_{17}O_7PCr^+$	417
$C_{13}H_{10}N^+$	143	$C_{13}H_{17}O_9^+$	224
$C_{13}H_{10}NBr^+$	468	$C_{13}H_{18}^+$	101
$C_{13}H_{10}NCl^+$	379	$C_{13}H_{18}N_2O^+$	245
$C_{13}H_{10}NF^+$	281	$C_{13}H_{18}O^+$	201
$C_{13}H_{10}NI^+$	512	$C_{13}H_{18}OCr^+$	411
$C_{13}H_{10}NO^+$	238	$C_{13}H_{18}OSi^+$	305

$C_{13}H_{18}SiFe^+$	433
$C_{13}H_{19}BrMoSn^+$	504
$C_{13}H_{19}ClMoSn^+$	504
$C_{13}H_{19}MoSnI^+$	519
$C_{13}H_{20}MoSn^+$	504
$C_{13}H_{20}NO^+$	238
$C_{13}H_{20}O^+$	201
$C_{13}H_{20}OSi^+$	305
$C_{13}H_{20}O_2^+$	217
$C_{13}H_{20}SnW^+$	540
$C_{13}H_{21}NO^+$	238
$C_{13}H_{21}SnTa^+$	532
$C_{13}H_{22}^+$	101
$C_{13}H_{22}Ge^+$	450
$C_{13}H_{22}NO^+$	239
$C_{13}H_{22}N_2^+$	160
$C_{13}H_{22}Si^+$	300
$C_{13}H_{22}Sn^+$	499
$C_{13}H_{23}NO^+$	239
$C_{13}H_{24}^+$	101
$C_{13}H_{24}NO^+$	239
$C_{13}H_{24}NO_2^+$	253
$C_{13}H_{24}N_2^+$	160
$C_{13}H_{24}Si_2^+$	300
$C_{13}H_{25}NO^+$	239
$C_{13}H_{25}N_2O_2^+$	258
$C_{13}H_{26}^+$	102
$C_{13}H_{27}OPCr^+$	416
$C_{13}H_{28}Sn^+$	500
$C_{13}H_{33}N_4Ti^+$	406
$C_{13}H_{36}N_6OP_2Fe^+$	434
$C_{13}H_{36}N_6OP_2Mo^+$	488
$C_{14}F_{10}^+$	273
$C_{14}HO_4F_{29}^+$	287
$C_{14}H_7O_6F_3Cr^+$	415
$C_{14}H_8^+$	102
$C_{14}H_8Br_2^+$	467
$C_{14}H_8Cl_2^+$	376
$C_{14}H_8NO_2Cl^+$	388
$C_{14}H_8O_2^+$	217
$C_{14}H_8O_3^+$	222
$C_{14}H_8O_4^+$	223
$C_{14}H_8O_6^+$	224
$C_{14}H_8S^+$	342
$C_{14}H_9Br^+$	466
$C_{14}H_9Cl^+$	375
$C_{14}H_9F^+$	276
$C_{14}H_9N^+$	144
$C_{14}H_9NO_2^+$	253
$C_{14}H_9OS^+$	356
$C_{14}H_9O_2^+$	217
$C_{14}H_9O_2S^+$	359
$C_{14}H_{10}^+$	102
$C_{14}H_{10}^{+2}$	103
$C_{14}H_{10}NF_3^+$	282
$C_{14}H_{10}N_2O^+$	245
$C_{14}H_{10}N_2O_2^+$	258
$C_{14}H_{10}O^+$	202
$C_{14}H_{10}OS^+$	356
$C_{14}H_{10}O_2^+$	217
$C_{14}H_{10}O_2S_2Fe_2^+$	435
$C_{14}H_{10}O_3^+$	222
$C_{14}H_{10}O_3S^+$	359
$C_{14}H_{10}O_3SFe_2^+$	435
$C_{14}H_{10}O_4Fe_2^+$	432
$C_{14}H_{10}O_4W_2^+$	535
$C_{14}H_{10}O_6Cr^+$	413
$C_{14}H_{10}O_7Cr^+$	413
$C_{14}H_{10}S^+$	336
$C_{14}H_{11}^+$	103

$C_{14}H_{11}N^+$	144
$C_{14}H_{11}NO^+$	239
$C_{14}H_{11}NO_3Cr^+$	414
$C_{14}H_{11}NS^+$	345
$C_{14}H_{11}OS^+$	357
$C_{14}H_{11}P^+$	313
$C_{14}H_{11}S^+$	336
$C_{14}H_{12}^+$	103
$C_{14}H_{12}N_2^+$	160
$C_{14}H_{12}N_2O_2^+$	258
$C_{14}H_{12}N_2O_4^+$	266
$C_{14}H_{12}O^+$	202
$C_{14}H_{12}O_2^+$	217
$C_{14}H_{12}O_2S^+$	359
$C_{14}H_{12}O_3^+$	222
$C_{14}H_{12}S^+$	336
$C_{14}H_{13}^+$	104
$C_{14}H_{13}N^+$	144
$C_{14}H_{13}NO^+$	239
$C_{14}H_{13}NO_2^+$	253
$C_{14}H_{13}NO_4^+$	265
$C_{14}H_{13}NO_3Cr^+$	414
$C_{14}H_{13}Sn^+$	499
$C_{14}H_{14}^+$	104
$C_{14}H_{14}N_2^+$	160
$C_{14}H_{14}N_2O_2^+$	258
$C_{14}H_{14}N_2O_4^+$	264
$C_{14}H_{14}N_2S_2^+$	350
$C_{14}H_{14}N_4O_2^+$	261
$C_{14}H_{14}O^+$	202
$C_{14}H_{14}OS^+$	357
$C_{14}H_{14}OSi^+$	305
$C_{14}H_{14}OSn^+$	500
$C_{14}H_{14}O_2^+$	217
$C_{14}H_{14}O_2S^+$	359
$C_{14}H_{14}O_3SSn^+$	502
$C_{14}H_{14}S^+$	336
$C_{14}H_{14}SGe^+$	453
$C_{14}H_{14}SSn^+$	502
$C_{14}H_{14}Si^+$	298
$C_{14}H_{14}SiS^+$	368
$C_{14}H_{15}N^+$	144
$C_{14}H_{15}NO^+$	239
$C_{14}H_{15}P^+$	313
$C_{14}H_{16}^+$	104
$C_{14}H_{16}Cr^+$	410
$C_{14}H_{16}Mo^+$	486
$C_{14}H_{16}N_2^+$	160
$C_{14}H_{16}OS_2^+$	360
$C_{14}H_{16}O_2^+$	217
$C_{14}H_{16}Ti^+$	406
$C_{14}H_{18}^+$	105
$C_{14}H_{18}Ge^+$	450
$C_{14}H_{18}N_2^+$	160
$C_{14}H_{18}O_2^+$	217
$C_{14}H_{18}O_2Cr^+$	412
$C_{14}H_{18}Si^+$	298
$C_{14}H_{18}Sn^+$	499
$C_{14}H_{19}NO^+$	239
$C_{14}H_{20}N_3O_2S_4Fe^+$	436
$C_{14}H_{20}O^+$	202
$C_{14}H_{20}O_2^+$	218
$C_{14}H_{20}O_{10}^+$	224
$C_{14}H_{20}S_3^+$	341
$C_{14}H_{21}O_8PCr^+$	418
$C_{14}H_{21}O_8PW^+$	537
$C_{14}H_{22}^+$	105
$C_{14}H_{22}O^+$	202
$C_{14}H_{22}O_2^+$	218
$C_{14}H_{22}Si_2^+$	300

$C_{14}H_{23}NO^+$	239
$C_{14}H_{23}P^+$	313
$C_{14}H_{24}^+$	105
$C_{14}H_{24}Si^+$	300
$C_{14}H_{25}NO^+$	240
$C_{14}H_{26}^+$	105
$C_{14}H_{26}Si^+$	300
$C_{14}H_{27}NO^+$	240
$C_{14}H_{27}O_2PCr^+$	416
$C_{14}H_{28}^+$	105
$C_{14}H_{30}Sn^+$	499
$C_{14}H_{32}Si^+$	300
$C_{14}H_{36}N_2Si_2Ge^+$	452
$C_{14}H_{36}N_2Si_2Pb^+$	550
$C_{14}H_{36}N_2Si_2Sn^+$	501
$C_{14}H_{36}N_6O_2P_2Fe^+$	434
$C_{14}H_{36}N_6O_2P_2Mo^+$	488
$C_{14}H_{36}N_6O_2P_2W^+$	537
$C_{14}H_{36}Si_4P^+$	325
$C_{14}H_{38}Si_4Ge^+$	452
$C_{14}H_{38}Si_4Hg^+$	547
$C_{14}H_{38}Si_4Pb^+$	550
$C_{14}H_{38}Si_4Sn^+$	501
$C_{15}H_3O_6F_{18}Al^+$	292
$C_{15}H_3O_6F_{18}Co^+$	440
$C_{15}H_3O_6F_{18}Cr^+$	415
$C_{15}H_3O_6F_{18}Fe^+$	433
$C_{15}H_3O_6F_{18}Ga^+$	448
$C_{15}H_3O_6F_{18}Mn^+$	423
$C_{15}H_3O_6F_{18}Ru^+$	490
$C_{15}H_3O_6F_{18}Sc^+$	405
$C_{15}H_3O_6F_{18}Ti^+$	407
$C_{15}H_3O_6F_{18}V^+$	408
$C_{15}H_6O_6Co_2^+$	439
$C_{15}H_9^+$	105
$C_{15}H_9N^+$	144
$C_{15}H_{10}Cl_2^+$	376
$C_{15}H_{10}N_2O_3^+$	264
$C_{15}H_{10}O^+$	202
$C_{15}H_{10}O_2^+$	218
$C_{15}H_{10}O_3W_2^+$	535
$C_{15}H_{10}S^+$	336
$C_{15}H_{11}^+$	105
$C_{15}H_{11}N^+$	144
$C_{15}H_{11}NO^+$	240
$C_{15}H_{11}NO_2^+$	253
$C_{15}H_{11}NO_3S^+$	364
$C_{15}H_{11}O_2S^+$	359
$C_{15}H_{11}P^+$	313
$C_{15}H_{12}^+$	105
$C_{15}H_{12}O^+$	202
$C_{15}H_{12}O_2^+$	218
$C_{15}H_{12}O_6F_9Al^+$	292
$C_{15}H_{12}O_6F_9Cr^+$	415
$C_{15}H_{12}O_6F_9Fe^+$	433
$C_{15}H_{13}^+$	106
$C_{15}H_{13}NO^+$	240
$C_{15}H_{14}^+$	106
$C_{15}H_{14}N_2^+$	160
$C_{15}H_{14}N_2O_2^+$	258
$C_{15}H_{14}N_2O_4^+$	266
$C_{15}H_{14}S^+$	336
$C_{15}H_{15}ClTh^+$	553
$C_{15}H_{15}ClU^+$	555
$C_{15}H_{15}La^+$	522
$C_{15}H_{15}N^+$	145
$C_{15}H_{15}NO_2^+$	253
$C_{15}H_{15}N_3O_2^+$	260
$C_{15}H_{15}Nd^+$	525
$C_{15}H_{15}O^+$	203

$C_{15}H_{15}Pr^+$	525
$C_{15}H_{16}^+$	107
$C_{15}H_{16}NO_2^+$	254
$C_{15}H_{16}N_2^+$	160
$C_{15}H_{16}OS^+$	357
$C_{15}H_{16}O_2^+$	218
$C_{15}H_{16}Sn^+$	499
$C_{15}H_{18}^+$	107
$C_{15}H_{18}NO_2^+$	254
$C_{15}H_{18}N_3O_{12}Co^+$	439
$C_{15}H_{18}N_3O_{12}Rh^+$	491
$C_{15}H_{18}N_3O_4^+$	261
$C_{15}H_{18}O_3Cr^+$	413
$C_{15}H_{18}O_6Cl_3Co^+$	441
$C_{15}H_{18}O_6CoBr_3^+$	480
$C_{15}H_{19}N_2O_{10}Rh^+$	491
$C_{15}H_{20}NO_8Rh^+$	491
$C_{15}H_{20}N_2OS^+$	362
$C_{15}H_{20}N_2O_2^+$	258
$C_{15}H_{21}O_6Co^+$	438
$C_{15}H_{21}O_6Cr^+$	413
$C_{15}H_{21}O_6Fe^+$	432
$C_{15}H_{21}O_6Mn^+$	423
$C_{15}H_{21}O_6Rh^+$	491
$C_{15}H_{22}Si_2^+$	300
$C_{15}H_{23}Cl^+$	375
$C_{15}H_{24}^+$	107
$C_{15}H_{24}N_2O_3^+$	264
$C_{15}H_{24}O_6Si_2Cr^+$	416
$C_{15}H_{24}O_6Si_2Mo^+$	487
$C_{15}H_{24}O_6Si_2W^+$	536
$C_{15}H_{24}Si_2^+$	300
$C_{15}H_{25}P^+$	313
$C_{15}H_{27}O_3PCr^+$	416
$C_{15}H_{28}^+$	107
$C_{15}H_{28}NO_3^+$	263
$C_{15}H_{28}NO_3S^+$	364
$C_{15}H_{29}NO_3^+$	263
$C_{15}H_{29}N_2O_2^+$	258
$C_{15}H_{30}NO^+$	240
$C_{15}H_{30}N_2O_2^+$	259
$C_{15}H_{31}NO^+$	240
$C_{15}H_{32}Sn^+$	499
$C_{15}H_{35}P_5^+$	315
$C_{15}H_{36}N_6O_3F_2Cr^+$	418
$C_{15}H_{36}N_6O_3F_2Fe^+$	434
$C_{15}H_{36}N_6O_3F_2Mo^+$	488
$C_{15}H_{36}N_6O_3F_2W^+$	537
$C_{16}F_{10}^+$	273
$C_{16}H_8^+$	107
$C_{16}H_8F_8^+$	278
$C_{16}H_8N_2^+$	160
$C_{16}H_{10}^+$	107
$C_{16}H_{10}N_2O_2^+$	259
$C_{16}H_{10}O^+$	203
$C_{16}H_{10}O_6W_2^+$	535
$C_{16}H_{11}^+$	108
$C_{16}H_{11}N_3O_4^+$	266
$C_{16}H_{12}^+$	108
$C_{16}H_{12}NCl^+$	379
$C_{16}H_{12}N_2O_2^+$	259
$C_{16}H_{12}O^+$	203
$C_{16}H_{12}O_2^+$	218
$C_{16}H_{13}^+$	108
$C_{16}H_{13}N^+$	145
$C_{16}H_{13}NO^+$	240
$C_{16}H_{13}NO_2^+$	254
$C_{16}H_{13}NS_2^+$	349
$C_{16}H_{14}^+$	108
$C_{16}H_{14}N_2O_2Co^+$	439

$C_{16}H_{14}N_2O_2Cu^+$	445
$C_{16}H_{14}N_2O_2Mn^+$	423
$C_{16}H_{14}N_2O_2Ni^+$	443
$C_{16}H_{14}N_2S_2^+$	350
$C_{16}H_{14}O_2^+$	218
$C_{16}H_{14}O_4^+$	223
$C_{16}H_{14}S_2^+$	339
$C_{16}H_{15}N^+$	145
$C_{16}H_{15}NS^+$	345
$C_{16}H_{16}^+$	108
$C_{16}H_{16}N_2O_2^+$	259
$C_{16}H_{16}N_4Co^+$	437
$C_{16}H_{16}N_4Cu^+$	444
$C_{16}H_{16}N_4Ni^+$	442
$C_{16}H_{16}O^+$	203
$C_{16}H_{16}O_2^+$	218
$C_{16}H_{16}Th^+$	553
$C_{16}H_{16}U^+$	554
$C_{16}H_{17}N^+$	145
$C_{16}H_{18}^+$	109
$C_{16}H_{18}N_2^+$	160
$C_{16}H_{18}N_2S^+$	348
$C_{16}H_{18}N_4^+$	166
$C_{16}H_{18}O^+$	203
$C_{16}H_{18}OS^+$	357
$C_{16}H_{18}O_2^+$	218
$C_{16}H_{18}S^+$	336
$C_{16}H_{20}^+$	109
$C_{16}H_{20}N_2^+$	160
$C_{16}H_{20}N_2O_6Mo_2^+$	487
$C_{16}H_{22}La^+$	522
$C_{16}H_{22}Nd^+$	525
$C_{16}H_{22}PAu^+$	545
$C_{16}H_{22}P_2I_2Pt^+$	544
$C_{16}H_{22}Pr^+$	525
$C_{16}H_{22}Si^+$	301
$C_{16}H_{24}N_2^+$	160
$C_{16}H_{24}N_2O^+$	245
$C_{16}H_{24}O_4S^+$	359
$C_{16}H_{26}^+$	109
$C_{16}H_{26}O_4S^+$	360
$C_{16}H_{27}O_4PCr^+$	416
$C_{16}H_{27}O_4PW^+$	536
$C_{16}H_{28}NO_4^+$	265
$C_{16}H_{28}NO_4S^+$	364
$C_{16}H_{28}N_2^+$	161
$C_{16}H_{28}N_4^+$	166
$C_{16}H_{29}N_2O_3^+$	264
$C_{16}H_{29}N_2O_4^+$	266
$C_{16}H_{30}N_2O_4P_2Cr^+$	418
$C_{16}H_{30}Si_2^+$	301
$C_{16}H_{32}Si_3^+$	301
$C_{16}H_{34}N_2^+$	161
$C_{16}H_{36}N_6O_4P_2Cr^+$	418
$C_{16}H_{36}N_6O_4P_2Mo^+$	488
$C_{16}H_{36}N_6O_4P_2W^+$	537
$C_{16}H_{36}P_4^+$	314
$C_{16}H_{36}Si_7^+$	303
$C_{16}H_{36}Sn^+$	499
$C_{16}H_{30}N_4Cr^+$	410
$C_{16}H_{30}N_4Hf^+$	531
$C_{16}H_{30}N_4Mo^+$	486
$C_{16}H_{30}N_4Ti^+$	406
$C_{16}H_{30}N_4Zr^+$	484
$C_{16}H_{34}OSi_4Re^+$	542
$C_{16}H_{34}Si_3Cr^+$	415
$C_{16}H_{34}Si_3Hf^+$	531
$C_{16}H_{34}Si_3Pb^+$	550
$C_{16}H_{34}Si_3Sn^+$	501
$C_{16}H_{34}Si_3Ti^+$	407

$C_{16}H_{34}Si_4Zr^+$	484
$C_{17}H_8N_3^+$	164
$C_{17}H_9NO_4^+$	266
$C_{17}H_{11}O_4Rh^+$	491
$C_{17}H_{12}^+$	109
$C_{17}H_{12}O^+$	203
$C_{17}H_{12}S_3^+$	341
$C_{17}H_{13}N^+$	145
$C_{17}H_{14}^+$	109
$C_{17}H_{14}NOCl^+$	386
$C_{17}H_{14}O^+$	203
$C_{17}H_{15}^+$	109
$C_{17}H_{15}N^+$	145
$C_{17}H_{16}O_2^+$	218
$C_{17}H_{17}D_3O_2^+$	218
$C_{17}H_{17}N_2OSCl^+$	401
$C_{17}H_{18}N_2OS^+$	362
$C_{17}H_{18}O^+$	203
$C_{17}H_{18}O_2^+$	218
$C_{17}H_{18}Si^+$	298
$C_{17}H_{19}N^+$	145
$C_{17}H_{19}NO_3^+$	263
$C_{17}H_{19}N_2SCL^+$	400
$C_{17}H_{20}N_2^+$	161
$C_{17}H_{20}N_2O^+$	245
$C_{17}H_{20}N_2S^+$	348
$C_{17}H_{20}O^+$	203
$C_{17}H_{20}OS^+$	357
$C_{17}H_{20}O_2^+$	218
$C_{17}H_{20}Si^+$	298
$C_{17}H_{22}N^+$	161
$C_{17}H_{22}O_2^+$	219
$C_{17}H_{25}N_2O_2^+$	259
$C_{17}H_{25}P_2BrPt^+$	544
$C_{17}H_{25}P_2ClPt^+$	544
$C_{17}H_{25}P_2IPt^+$	544
$C_{17}H_{28}Si^+$	301
$C_{17}H_{29}N^+$	145
$C_{17}H_{29}P^+$	313
$C_{17}H_{32}N_2O_5^+$	267
$C_{17}H_{33}N_2O_2^+$	259
$C_{18}H_8N_4^+$	166
$C_{18}H_{10}^+$	109
$C_{18}H_{11}NO_2^+$	254
$C_{18}H_{12}^+$	109
$C_{18}H_{12}F_3P^+$	322
$C_{18}H_{12}O^+$	203
$C_{18}H_{12}PCl_3^+$	397
$C_{18}H_{14}^+$	110
$C_{18}H_{15}Al^+$	291
$C_{18}H_{15}As^+$	455
$C_{18}H_{15}Bi^+$	552
$C_{18}H_{15}ClSn^+$	503
$C_{18}H_{15}Ga^+$	448
$C_{18}H_{15}GeBr^+$	481
$C_{18}H_{15}N^+$	145
$C_{18}H_{15}O_3P^+$	319
$C_{18}H_{15}P^+$	313
$C_{18}H_{15}PCr^+$	416
$C_{18}H_{15}Sb^+$	505
$C_{18}H_{15}Si^+$	298
$C_{18}H_{15}Sn^+$	500
$C_{18}H_{16}^+$	110
$C_{18}H_{16}Ge^+$	450
$C_{18}H_{16}NP^+$	315
$C_{18}H_{16}N_2O_2^+$	259
$C_{18}H_{16}N_2O_2S_4Fe^+$	436
$C_{18}H_{16}O^+$	203
$C_{18}H_{16}S^+$	336
$C_{18}H_{16}Si^+$	299

$C_{18}H_{16}Sn^+$	500
$C_{18}H_{17}N^+$	146
$C_{18}H_{17}N_2Br^+$	469
$C_{18}H_{17}N_3O_2^+$	260
$C_{18}H_{17}OSMn^+$	426
$C_{18}H_{17}SMn^+$	426
$C_{18}H_{18}^+$	110
$C_{18}H_{18}N_2^+$	161
$C_{18}H_{18}O^+$	203
$C_{18}H_{18}O_2^+$	219
$C_{18}H_{18}O_3^+$	222
$C_{18}H_{20}^+$	111
$C_{18}H_{20}N_2^+$	161
$C_{18}H_{20}N_2O_2^+$	259
$C_{18}H_{20}O^+$	203
$C_{18}H_{21}BrU^+$	555
$C_{18}H_{21}ClTh^+$	553
$C_{18}H_{21}ClU^+$	555
$C_{18}H_{22}N_2OS^+$	362
$C_{18}H_{22}N_2O_2^+$	259
$C_{18}H_{22}N_2S^+$	348
$C_{18}H_{22}OS^+$	357
$C_{18}H_{22}O_2^+$	219
$C_{18}H_{24}Cr^+$	410
$C_{18}H_{24}Mo^+$	486
$C_{18}H_{24}N_2^+$	161
$C_{18}H_{24}N_2O_2^+$	259
$C_{18}H_{24}N_4^+$	166
$C_{18}H_{24}V^+$	407
$C_{18}H_{25}N_3O_3^+$	264
$C_{18}H_{26}NO_2P^+$	320
$C_{18}H_{26}PCl^+$	396
$C_{18}H_{27}N^+$	146
$C_{18}H_{27}P^+$	313
$C_{18}H_{28}N_2O_2S_4Fe^+$	436
$C_{18}H_{28}P_2Pt^+$	543
$C_{18}H_{30}N_2O_4^+$	266
$C_{18}H_{33}P^+$	313
$C_{18}H_{34}N_3O_3^+$	265
$C_{18}H_{34}Si^+$	301
$C_{18}H_{35}N_2O_2^+$	259
$C_{18}H_{36}Si^+$	301
$C_{18}H_{38}Si^+$	302
$C_{18}H_{40}Si^+$	302
$C_{18}H_{42}N_3Cr^+$	410
$C_{18}H_{44}Si^+$	302
$C_{18}O_{18}Os_6^+$	543
$C_{19}H_3O_{16}F_{18}Mn^+$	423
$C_{19}H_{13}As^+$	455
$C_{19}H_{13}N^+$	146
$C_{19}H_{13}P^+$	313
$C_{19}H_{15}OPCr^+$	416
$C_{19}H_{16}^+$	111
$C_{19}H_{16}NO_2^+$	254
$C_{19}H_{17}P^+$	313
$C_{19}H_{18}NO_2^+$	254
$C_{19}H_{18}NP^+$	315
$C_{19}H_{18}O^+$	204
$C_{19}H_{19}N^+$	146
$C_{19}H_{20}^+$	111
$C_{19}H_{20}N_2^+$	161
$C_{19}H_{20}O^+$	204
$C_{19}H_{20}O_2^+$	219
$C_{19}H_{21}NO_3^+$	263
$C_{19}H_{21}N_2OSCl^+$	401
$C_{19}H_{22}^+$	111
$C_{19}H_{22}N_2OS^+$	362
$C_{19}H_{22}O^+$	204
$C_{19}H_{23}N^+$	146
$C_{19}H_{23}N_3OS^+$	363

$C_{19}H_{24}N_2^+$	161
$C_{19}H_{26}O_4MoSn^+$	504
$C_{19}H_{28}N_3O_3^+$	265
$C_{19}H_{29}OP^+$	317
$C_{19}H_{34}Sn^+$	500
$C_{19}H_{35}N_2O_3^+$	264
$C_{19}H_{35}O_2P^+$	318
$C_{19}H_{36}N_2O_4^+$	266
$C_{20}H_{12}^+$	111
$C_{20}H_{13}NO_3^+$	263
$C_{20}H_{14}^+$	111
$C_{20}H_{14}O_2^+$	219
$C_{20}H_{14}O_3^+$	222
$C_{20}H_{15}NO_2^+$	254
$C_{20}H_{15}O_3PCr^+$	416
$C_{20}H_{15}O_3PW^+$	536
$C_{20}H_{16}Fe_2^+$	430
$C_{20}H_{16}O_4F_{12}U^+$	555
$C_{20}H_{17}O_3SMn^+$	427
$C_{20}H_{17}O_3SMn^+$	427
$C_{20}H_{18}^+$	111
$C_{20}H_{18}Fe_2^+$	430
$C_{20}H_{18}N_2^+$	161
$C_{20}H_{19}N_3O_2F_3S^+$	367
$C_{20}H_{19}P^+$	313
$C_{20}H_{20}^+$	112
$C_{20}H_{20}NP^+$	315
$C_{20}H_{20}N_2O^+$	245
$C_{20}H_{20}N_2O_2S_4Fe^+$	436
$C_{20}H_{21}N_2OF_3S^+$	367
$C_{20}H_{22}N_2^+$	161
$C_{20}H_{22}N_2O^+$	245
$C_{20}H_{22}N_2O_2SCo^+$	440
$C_{20}H_{22}N_2O_2SCu^+$	446
$C_{20}H_{22}N_2O_2SNI^+$	444
$C_{20}H_{22}N_2O_3Co^+$	439
$C_{20}H_{22}N_2O_3Cu^+$	445
$C_{20}H_{22}N_2O_3Ni^+$	443
$C_{20}H_{22}O_3^+$	219
$C_{20}H_{23}N^+$	146
$C_{20}H_{23}N_3O_2Co^+$	439
$C_{20}H_{23}N_3O_2Cu^+$	445
$C_{20}H_{23}N_3O_2Ni^+$	443
$C_{20}H_{24}^+$	112
$C_{20}H_{24}N_3^+$	161
$C_{20}H_{24}N_2OS^+$	363
$C_{20}H_{24}N_2O_2^+$	259
$C_{20}H_{24}N_2O_3S^+$	364
$C_{20}H_{24}N_2O_3^+$	264
$C_{20}H_{24}N_3SCL^+$	401
$C_{20}H_{24}O^+$	204
$C_{20}H_{24}O_6^+$	224
$C_{20}H_{25}N_3O^+$	246
$C_{20}H_{25}N_3O_2^+$	260
$C_{20}H_{25}N_3S^+$	349
$C_{20}H_{26}O_2^+$	219
$C_{20}H_{28}^+$	112
$C_{20}H_{28}N_2O_2^+$	259
$C_{20}H_{28}N_3O_4^+$	267
$C_{20}H_{28}O_8Th^+$	553
$C_{20}H_{28}O_8U^+$	554
$C_{20}H_{28}O_8Zr^+$	484
$C_{20}H_{30}^+$	112
$C_{20}H_{30}Cl_2Zr^+$	484
$C_{20}H_{30}Co^+$	437
$C_{20}H_{30}Cr^+$	410
$C_{20}H_{30}Fe^+$	430
$C_{20}H_{30}Mn^+$	422
$C_{20}H_{30}Ni^+$	442
$C_{20}H_{30}S_2^+$	339

$C_{20}H_{30}Si_2^+$	301	$C_{22}H_{48}Si_4^+$	302
$C_{20}H_{30}V^+$	407	$C_{22}H_{34}Si_6^+$	302
$C_{20}H_{32}NP^+$	315	$C_{23}H_{13}NS_2^+$	350
$C_{20}H_{32}S_2^+$	339	$C_{23}H_{15}O_5AsMo^+$	489
$C_{20}H_{34}N_2^+$	161	$C_{23}H_{15}O_5AsW^+$	539
$C_{20}H_{34}NiO_1^+$	267	$C_{23}H_{13}O_5MnSn^+$	503
$C_{20}H_{36}^+$	112	$C_{23}H_{13}O_5MoSb^+$	506
$C_{20}H_{36}N_2O_6^+$	267	$C_{23}H_{15}O_5PCr^+$	417
$C_{20}H_{36}O_6^+$	224	$C_{23}H_{13}O_5PMo^+$	488
$C_{20}H_{36}O_8Mo_2^+$	487	$C_{23}H_{13}O_5PW^+$	537
$C_{20}H_{37}N_3O_5^+$	267	$C_{23}H_{15}O_5SbW^+$	540
$C_{20}H_{38}Si_2^+$	301	$C_{23}H_{13}O_5SnRe^+$	542
$C_{20}H_{38}Si_4^+$	302	$C_{23}H_{15}O_8PCr^+$	418
$C_{20}H_{44}Cr^+$	410	$C_{23}H_{15}O_8PW^+$	537
$C_{20}H_{44}Ge^+$	450	$C_{23}H_{17}F_2P^+$	321
$C_{20}H_{44}Hf^+$	531	$C_{23}H_{17}P^+$	314
$C_{20}H_{44}Sn^+$	500	$C_{23}H_{17}PCl_2^+$	397
$C_{20}H_{44}Ti^+$	406	$C_{23}H_{19}P^+$	314
$C_{20}H_{44}Zr^+$	484	$C_{23}H_{24}O^+$	204
$C_{20}H_{48}Si_4^+$	302	$C_{23}H_{26}^+$	114
$C_{21}H_{12}F_9P^+$	322	$C_{23}H_{20}N_3OS^+$	363
$C_{21}H_{14}D^+$	113	$C_{23}H_{30}O^+$	204
$C_{21}H_{14}N_2O_2^+$	259	$C_{23}H_{32}N_3O_3^+$	265
$C_{21}H_{15}^+$	112	$C_{23}H_{33}O_3PCr^+$	417
$C_{21}H_{15}Cl^+$	375	$C_{23}H_{33}O_3PMo^+$	488
$C_{21}H_{15}NO_2^+$	254	$C_{23}H_{33}O_3PW^+$	537
$C_{21}H_{15}O_3PCr^+$	416	$C_{23}H_{40}O_2^+$	219
$C_{21}H_{15}O_3PW^+$	536	$C_{23}H_{43}N_3O_5^+$	267
$C_{21}H_{21}O_3P^+$	319	$C_{24}H_{12}^+$	114
$C_{21}H_{21}P^+$	314	$C_{24}H_{14}^+$	114
$C_{21}H_{22}NP^+$	315	$C_{24}H_{16}^+$	114
$C_{21}H_{22}O^+$	204	$C_{24}H_{16}N_2^+$	161
$C_{21}H_{24}NSiP^+$	325	$C_{24}H_{16}O_2^+$	219
$C_{21}H_{24}N_2O_2Co^+$	439	$C_{24}H_{16}Si^+$	299
$C_{21}H_{24}N_2O_2Cu^+$	445	$C_{24}H_{17}NO_2^+$	254
$C_{21}H_{24}N_2O_2Ni^+$	443	$C_{24}H_{20}^+$	114
$C_{21}H_{24}N_2F_3S^+$	366	$C_{24}H_{20}NP^+$	316
$C_{21}H_{24}Si_2^+$	301	$C_{24}H_{20}N_3F_2P_3^+$	323
$C_{21}H_{26}N_2O_2^+$	260	$C_{24}H_{20}O_3Fe_4^+$	432
$C_{21}H_{26}N_2S_2^+$	350	$C_{24}H_{20}Si^+$	299
$C_{21}H_{26}N_3OSCl^+$	401	$C_{24}H_{20}Sn^+$	500
$C_{21}H_{31}O_2P^+$	318	$C_{24}H_{22}^+$	115
$C_{21}H_{32}Si_4^+$	301	$C_{24}H_{22}MnAs^+$	457
$C_{22}H_{10}O_4^+$	223	$C_{24}H_{22}MnSb^+$	505
$C_{22}H_{12}^+$	113	$C_{24}H_{22}PMn^+$	424
$C_{22}H_{12}O_2^+$	219	$C_{24}H_{21}^+$	115
$C_{22}H_{14}^+$	113	$C_{24}H_{24}N_2O_2^+$	260
$C_{22}H_{15}O_4FeAs^+$	458	$C_{24}H_{24}N_1O_1CrMo^+$	489
$C_{22}H_{15}O_4PCr^+$	416	$C_{24}H_{24}N_1O_1Cr_2^+$	415
$C_{22}H_{15}O_4PW^+$	536	$C_{24}H_{24}N_1O_1MoW^+$	540
$C_{22}H_{18}^+$	113	$C_{24}H_{24}N_1O_1Mo_2^+$	487
$C_{22}H_{18}O^+$	204	$C_{24}H_{24}N_1O_4W_2^+$	535
$C_{22}H_{20}^+$	114	$C_{24}H_{26}NP^+$	316
$C_{22}H_{20}Si^+$	299	$C_{24}H_{26}N_2O_2^+$	260
$C_{22}H_{21}P^+$	314	$C_{24}H_{26}Si_2^+$	301
$C_{22}H_{22}^+$	114	$C_{24}H_{28}N_2O_2^+$	260
$C_{22}H_{24}NP^+$	315	$C_{24}H_{30}N_3P^+$	316
$C_{22}H_{24}N_2O_2S_2Fe^+$	436	$C_{24}H_{33}La^+$	522
$C_{22}H_{24}N_3O_2F_3S^+$	367	$C_{24}H_{33}Nd^+$	525
$C_{22}H_{25}SiP^+$	325	$C_{24}H_{33}Pr^+$	525
$C_{22}H_{26}N_3OF_3S^+$	367	$C_{24}H_{36}Cr^+$	410
$C_{22}H_{27}N_3OS^+$	363	$C_{24}H_{36}N_4O_3Rh_2^+$	491
$C_{22}H_{30}N_1O_2S_2^+$	364	$C_{24}H_{44}P_4^+$	314
$C_{22}H_{32}N_3O_2^+$	260	$C_{24}H_{50}P_2S_4Sn_2^+$	502
$C_{22}H_{36}O_4Co^+$	438	$C_{25}H_{16}^+$	115
$C_{22}H_{40}O_4Ni^+$	443	$C_{25}H_{18}N_2O_2^+$	260
$C_{22}H_{46}O_4Pd^+$	492	$C_{25}H_{21}P^+$	314
$C_{22}H_{46}O_4Zn^+$	447	$C_{25}H_{22}OMnAs^+$	457
$C_{22}H_{46}Si_4^+$	302	$C_{25}H_{22}OMnSb^+$	505
$C_{22}H_{48}N_2S_4Sn_2^+$	502	$C_{25}H_{22}OPMn^+$	424

$C_{25}H_{22}PSMn^+$	428
$C_{25}H_{22}SMnAs^+$	457
$C_{25}H_{22}SMnSb^+$	505
$C_{25}H_{22}O_2P^+$	318
$C_{25}H_{23}P^+$	314
$C_{25}H_{23}N_2I^+$	512
$C_{25}H_{37}N_3O_4^+$	267
$C_{25}H_{37}N_4O_3^+$	265
$C_{26}H_{14}^+$	115
$C_{26}H_{16}^+$	115
$C_{26}H_{22}OPSMn^+$	428
$C_{26}H_{22}OSMnAs^+$	457
$C_{26}H_{22}OSMnSb^+$	505
$C_{26}H_{22}O_2MnAs^+$	457
$C_{26}H_{22}O_2MnSb^+$	505
$C_{26}H_{22}O_2PMn^+$	424
$C_{26}H_{23}O_3PCr^+$	417
$C_{26}H_{24}^+$	116
$C_{26}H_{24}N_2^+$	161
$C_{26}H_{26}Si_2^+$	301
$C_{26}H_{32}Si_4^+$	302
$C_{26}H_{37}N_3O_4^+$	267
$C_{26}H_{40}N_2O_7S^+$	364
$C_{26}H_{38}Si_6^+$	302
$C_{27}H_{23}O_3PSCr^+$	419
$C_{27}H_{27}NFP^+$	322
$C_{27}H_{33}P^+$	314
$C_{27}H_{39}Si_3P^+$	325
$C_{27}H_{40}N_4O_8S^+$	364
$C_{28}H_{14}^+$	116
$C_{28}H_{16}^+$	116
$C_{28}H_{20}^+$	117
$C_{28}H_{20}N_2O_2S_3Fe^+$	436
$C_{28}H_{24}O_6PSCr^+$	419
$C_{28}H_{29}O_7PCr^+$	417
$C_{28}H_{34}^+$	117
$C_{29}H_{22}P^+$	314
$C_{29}H_{33}N_2I^+$	512
$C_{30}H_{11}^+$	117
$C_{30}H_{16}^+$	117
$C_{30}H_{18}^+$	117
$C_{30}H_{20}S_2^+$	339
$C_{30}H_{32}N_4^+$	166
$C_{30}H_{39}P^+$	314
$C_{30}H_{45}N_5O_6^+$	267
$C_{30}H_{64}Si_6^+$	303
$C_{31}H_{37}N_2P^+$	316
$C_{32}H_{14}^+$	118
$C_{32}H_{16}^+$	118
$C_{32}H_{16}N_8Co^+$	438
$C_{32}H_{16}N_8Cu^+$	445
$C_{32}H_{16}N_8Fe^+$	430
$C_{32}H_{16}N_8Mn^+$	422
$C_{32}H_{16}N_8Ni^+$	442
$C_{32}H_{16}N_8Zn^+$	447
$C_{32}H_{18}^+$	118
$C_{32}H_{18}N_8^+$	167
$C_{32}H_{21}NCl^+$	379
$C_{33}H_{20}N_2Cl^+$	380
$C_{33}H_{57}O_6Fe^+$	432
$C_{34}H_{16}^+$	118
$C_{34}H_{18}^+$	118
$C_{34}H_{20}^+$	118
$C_{35}H_{27}P^+$	314
$C_{36}H_{16}^+$	119
$C_{36}H_{18}^+$	119
$C_{36}H_{20}^+$	119
$C_{36}H_{23}NCl^+$	379
$C_{36}H_{30}Si_2^+$	301
$C_{36}H_{44}N_4Co^+$	437

$C_{36}H_{44}N_4Cu^+$	445
$C_{36}H_{44}N_4Fe^+$	430
$C_{36}H_{44}N_4Mg^+$	290
$C_{36}H_{44}N_4Ni^+$	442
$C_{36}H_{44}N_4Pd^+$	492
$C_{36}H_{44}N_4Zn^+$	446
$C_{36}H_{46}N_4^+$	166
$C_{38}H_{16}^+$	119
$C_{38}H_{18}^+$	119
$C_{38}H_{20}^+$	119
$C_{38}H_{22}^+$	119
$C_{38}H_{26}^+$	119
$C_{40}H_{20}^+$	119
$C_{40}H_{30}O_3P_2Mo^+$	488
$C_{40}H_{40}O_4P_2W^+$	537
$C_{40}H_{56}^+$	119
$C_{42}H_{18}^+$	119
$C_{42}H_{20}^+$	120
$C_{42}H_{22}^+$	120
$C_{42}H_{24}^+$	120
$C_{42}H_{30}^+$	120
$C_{44}H_{20}^+$	120
$C_{44}H_{28}N_3ClFe^+$	436
$C_{44}H_{28}N_4ClMn^+$	428
$C_{44}H_{28}N_4Co^+$	438
$C_{44}H_{28}N_4Cu^+$	445
$C_{44}H_{28}N_4Fe^+$	430
$C_{44}H_{28}N_4Mg^+$	290
$C_{44}H_{28}N_4Mn^+$	422
$C_{44}H_{28}N_4Ni^+$	442
$C_{44}H_{28}N_4Pb^+$	550
$C_{44}H_{28}N_4Zn^+$	447
$C_{44}H_{30}N_4^+$	166
$C_{45}H_{31}P_2Cl^+$	396
$C_{46}H_{26}^+$	120
$C_{48}H_{24}^+$	120
$C_{50}H_{28}^+$	120
$C_{54}H_{30}^+$	120
$C_{55}H_{72}N_4O_5Mg^+$	290
$C_{58}H_{12}^+$	120
Ca^+	405
Ca^{+2}	405
$CaBr^+$	480
CaI^+	515
CaI_2^+	515
Cd^+	495
CdI_2^+	518
Ce^+	523
$CeAu^+$	545
$CeIr^+$	543
$CePt^+$	544
Ce_2^+	523
Cf^+	555
Cl^+	370
Cl^{+2}	370
$ClAg^+$	493
$ClAg_2^+$	493
$ClAg_4^+$	493
$ClAs^+$	457
$ClBa^+$	521
$ClBrSn^+$	504
$ClBr_2Ag_3^+$	494
$ClBr_3Sn^+$	504
$ClCo^+$	440
$ClCs^+$	520
$ClCu^+$	446
$ClCu_2^+$	446
$ClGd^+$	528
ClI^+	515
$ClIn^+$	496

ClK ⁺	405
ClMo ⁺	489
ClNb ⁺	485
ClNd ⁺	526
ClRb ⁺	482
ClSr ⁺	483
ClTi ⁺	548
ClV ⁺	408
ClW ⁺	538
ClYb ⁺	530
ClZr ⁺	484
Cl ₂ ⁺	370
Cl ₂ Ag ₂ ⁺	493
Cl ₂ Ag ₃ ⁺	493
Cl ₂ As ⁺	457
Cl ₂ Ba ⁺	522
Cl ₂ BrAg ₃ ⁺	494
Cl ₂ Ca ⁺	405
Cl ₂ Cd ⁺	495
Cl ₂ Co ⁺	441
Cl ₂ Cr ⁺	420
Cl ₂ Cs ₂ ⁺	521
Cl ₂ CuAg ₂ ⁺	494
Cl ₂ Cu ₂ ⁺	446
Cl ₂ Cu ₂ Ag ⁺	494
Cl ₂ Cu ₃ ⁺	446
Cl ₂ Fe ⁺	436
Cl ₂ Gd ⁺	528
Cl ₂ Hg ⁺	547
Cl ₂ K ₂ ⁺	405
Cl ₂ Mn ⁺	428
Cl ₂ Mo ⁺	489
Cl ₂ Nb ⁺	485
Cl ₂ Nd ⁺	526
Cl ₂ Ni ⁺	444
Cl ₂ Pb ⁺	551
Cl ₂ Rb ₂ ⁺	482
Cl ₂ Se ⁺	462
Cl ₂ Se ₂ ⁺	462
Cl ₂ Sn ⁺	503
Cl ₂ Sr ⁺	483
Cl ₂ Ta ⁺	532
Cl ₂ V ⁺	408
Cl ₂ W ⁺	538
Cl ₂ Yb ⁺	530
Cl ₂ Zn ⁺	447
Cl ₂ Zr ⁺	484
Cl ₃ Ag ₄ ⁺	494
Cl ₃ Ag ₄ ⁺	494
Cl ₃ As ⁺	457
Cl ₃ CuAg ₂ ⁺	494
Cl ₃ Cu ₂ Ag ⁺	494
Cl ₃ Cu ₃ ⁺	446
Cl ₃ Cu ₄ ⁺	446
Cl ₃ Ga ⁺	448
Cl ₃ Ge ⁺	453
Cl ₃ In ⁺	496
Cl ₃ Mo ⁺	489
Cl ₃ Nb ⁺	485
Cl ₃ Nd ⁺	526
Cl ₃ Sb ⁺	505
Cl ₃ Ta ⁺	532
Cl ₃ V ⁺	408
Cl ₃ W ⁺	538
Cl ₃ Zr ⁺	484
Cl ₄ Ag ₄ ⁺	494
Cl ₄ Cu ₄ ⁺	446
Cl ₄ Cu ₅ ⁺	446
Cl ₄ Ge ⁺	453
Cl ₄ Hf ⁺	531

Cl ₄ Mo ⁺	489
Cl ₄ Nb ⁺	485
Cl ₄ Ta ⁺	532
Cl ₄ Th ⁺	553
Cl ₄ Ti ⁺	407
Cl ₄ U ⁺	555
Cl ₄ W ⁺	538
Cl ₄ Zr ⁺	484
Cl ₅ Cu ₅ ⁺	446
Cl ₅ Mo ⁺	489
Cl ₅ Nb ⁺	485
Cl ₅ Re ⁺	542
Cl ₅ Ta ⁺	532
Cl ₅ W ⁺	538
Cl ₆ Ga ₂ ⁺	448
Cl ₆ W ⁺	538
Cl ₉ Re ₃ ⁺	542
Cm ⁺	555
Co ⁺	437
Cr ⁺	409
Cs ⁺	520
CsAu ⁺	545
Cs ²⁺	520
Cs ₂ ⁺	520
Cu ⁺	444
CuDy ⁺	529
CuGe ⁺	454
CuHo ⁺	529
CuSn ⁺	503
CuTb ⁺	528
Cu ₂ ⁺	444
Cu ₂ Sn ⁺	503
Cu ₃ Br ₃ ⁺	480
Cu ₃ I ₃ ⁺	516
Cu ₃ Br ₃ ⁺	480
Cu ₃ Br ₄ ⁺	480
D ⁺	42
DBr ⁺	463
DF ⁺	269
DI ⁺	508
DLi ⁺	42
DO ⁺	171
D ₂ ⁺	42
D ₂ N ⁺	123
D ₂ N ₂ ⁺	124
D ₂ O ⁺	172
D ₂ Si ⁺	292
D ₃ N ⁺	123
D ₃ Si ⁺	292
Dy ⁺	528
Er ⁺	529
Eu ⁺	526
Eu ⁺²	527
Eu ₂ ⁺	527
F ⁺	268
FAg ⁺	493
FAl ⁺	292
FAs ⁺	456
FBr ⁺	473
FCe ⁺	523
FCl ⁺	389
FCr ⁺	415
FCs ⁺	520
FGa ⁺	448
FGe ⁺	451
FI ⁺	513
FK ₂ ⁺	404
FKr ⁺	482
FLa ⁺	523
FMn ⁺	423

FMo ⁺	487	F ₄ S ⁺	365
FNa ₂ ⁺	290	F ₄ SW ⁺	538
FP ⁺	320	F ₄ Si ⁺	307
FPSBr ₂ ⁺	479	F ₄ U ⁺	554
FS ⁺	365	F ₄ W ⁺	536
FS ₂ ⁺	365	F ₄ Xe ⁺	519
FTI ⁺	548	F ₃ Br ⁺	473
FTI ₂ ⁺	548	F ₃ Ce ₂ ⁺	524
FV ⁺	408	F ₃ Ga ₂ ⁺	448
FW ⁺	536	F ₅ I ⁺	514
F ₂ ⁺	268	F ₅ La ₂ ⁺	523
F ₂ ¹⁵ Cl ⁺	389	F ₅ Mo ⁺	487
F ₂ Al ⁺	292	F ₅ P ⁺	320
F ₂ As ⁺	456	F ₅ S ⁺	365
F ₂ Cd ⁺	495	F ₅ SCI ⁺	401
F ₂ Ce ⁺	523	F ₅ U ⁺	554
F ₂ Cr ⁺	415	F ₅ W ⁺	536
F ₂ Ga ⁺	448	F ₆ Mo ⁺	487
F ₂ Ge ⁺	451	F ₆ Re ⁺	541
F ₂ Kr ⁺	482	F ₆ S ⁺	365
F ₂ La ⁺	523	F ₆ Si ₂ ⁺	307
F ₂ Mn ⁺	423	F ₆ U ⁺	554
F ₂ Mo ⁺	487	F ₆ Xe ⁺	519
F ₂ P ⁺	320	F ₇ Re ⁺	541
F ₂ PBr ⁺	477	F ₁₂ P ₄ Cl ₂ Rh ₂ ⁺	492
F ₂ PCI ⁺	398	F ₁₂ P ₄ Ni ⁺	444
F ₂ PI ⁺	515	F ₁₂ P ₄ Pd ⁺	492
F ₂ PSBr ⁺	479	F ₁₂ P ₄ Pt ⁺	543
F ₂ S ⁺	365	F ₁₅ P ₅ Fe ⁺	434
F ₂ SW ⁺	538	F ₁₅ P ₅ Ru ⁺	490
F ₂ S ₂ ⁺	365	F ₁₈ P ₆ Cr ⁺	418
F ₂ S ₂ W ⁺	538	F ₁₈ P ₆ Mo ⁺	488
F ₂ Se ⁺	461	F ₁₈ P ₆ W ⁺	538
F ₂ Si ⁺	307	Fe ⁺	428
F ₂ Sn ⁺	501	Fe ²⁺	429
F ₂ Tl ₂ ⁺	548	Fe ₂ ⁺	429
F ₂ V ⁺	408	Ga ⁺	447
F ₂ W ⁺	536	GaBi ⁺	552
F ₂ Xe ⁺	519	GaBr ₃ ⁺	481
F ₂ Zn ⁺	447	GaI ⁺	517
F ₃ As ⁺	456	GaI ₃ ⁺	517
F ₃ Bi ⁺	552	GaSb ⁺	506
F ₃ Br ⁺	473	Ga ₂ ⁺	447
F ₃ Ce ⁺	523	Gd ⁺	527
F ₃ Cl ⁺	389	Ge ⁺	448
F ₃ Cr ⁺	415	GeAu ⁺	545
F ₃ Ge ⁺	451	GeI ₄ ⁺	517
F ₃ Mn ⁺	423	GeSe ⁺	462
F ₃ Mo ⁺	487	GeTe ⁺	508
F ₃ P ⁺	320	Ge ₂ ⁺	449
F ₃ PCo ⁺	440	H ⁺	42
F ₃ PS ⁺	370	HB ⁺	43
F ₃ S ⁺	365	HBNF ⁺	279
F ₃ SW ⁺	538	HBNF ₄ P ⁺	322
F ₃ Sb ⁺	505	HBO ₂ ⁺	173
F ₃ Si ⁺	307	HBS ⁺	327
F ₃ SiBr ⁺	476	HBe ⁺	43
F ₃ SiCl ⁺	396	HBr ⁺	463
F ₃ SiPCI ₃ Co ⁺	441	HCa ⁺	405
F ₃ V ⁺	408	HCl ⁺	370
F ₃ W ⁺	536	HD ⁺	42
F ₃ AlCs ⁺	520	HDN ⁺	123
F ₃ AlK ⁺	405	HDO ⁺	172
F ₃ As ⁺	456	HF ⁺	268
F ₃ Bi ⁺	552	HF ₂ P ⁺	320
F ₃ Ge ⁺	451	HF ₃ Si ⁺	307
F ₃ Ge ₂ ⁺	451	HF ₁₂ P ₄ Co ⁺	440
F ₃ Mn ⁺	423	HF ₁₂ P ₄ Ir ⁺	543
F ₄ Mo ⁺	487	HF ₁₂ P ₄ Rh ⁺	491
F ₄ P ₂ ⁺	320	HF ₁₅ P ₅ Mn ⁺	425

HI ⁺	508
HLi ⁺	42
HLi ₂ ⁺	43
HMn ⁺	421
HN ⁺	123
HNBBr ₂ ⁺	468
HNCI ₂ ⁺	378
HNF ₂ ⁺	279
HNF ₂ P ₂ ⁺	322
HNF ₆ P ₂ ⁺	322
HNO ⁺	226
HNOS ⁺	360
HNO ₂ ⁺	226
HNO ₃ ⁺	226
HN ₂ ⁺	124
HN ₃ ⁺	124
HO ⁺	171
HOCl ⁺	382
HO ⁺	283
HO ₂ ⁺	172
HP ⁺	310
HS ⁺	326
HSe ⁺	458
HSi ⁺	292
HSiCl ₃ ⁺	394
HTe ⁺	506
H ₂ ⁺	42
H ₂ B ⁺	43
H ₂ BNF ⁺	279
H ₂ BNF ₂ ⁺	279
H ₂ Br ⁺	463
H ₂ Br ₂ ⁺	463
H ₂ Cl ⁺	370
H ₂ Cl ₂ ⁺	370
H ₂ Cl ₂ Ge ⁺	453
H ₂ F ⁺	269
H ₂ F ₂ Ge ⁺	451
H ₂ F ₂ Si ⁺	307
H ₂ F ₂ SiAs ⁺	456
H ₂ F ₂ SiP ⁺	325
H ₂ F ₁₂ P ₄ Fe ⁺	434
H ₂ GeBr ₂ ⁺	481
H ₂ GeI ₂ ⁺	517
H ₂ Li ⁺	42
H ₂ N ⁺	123
H ₂ NBr ⁺	468
H ₂ NCl ⁺	377
H ₂ NF ₂ P ⁺	322
H ₂ N ₂ ⁺	124
H ₂ O ⁺	171
H ₂ O ₂ ⁺	172
H ₂ P ⁺	310
H ₂ S ⁺	326
H ₂ S ₂ ⁺	327
H ₂ Se ⁺	458
H ₂ Si ⁺	292
H ₂ SiBr ₂ ⁺	476
H ₂ SiCl ₂ ⁺	394
H ₂ SiI ₂ ⁺	514
H ₂ Te ⁺	506
H ₃ As ⁺	454
H ₃ B ⁺	43
H ₃ BF ₄ P ⁺	320
H ₃ B ₃ N ₃ Cl ₃ ⁺	378
H ₃ B ₃ N ₃ F ₃ ⁺	279
H ₃ ClGe ⁺	453
H ₃ FCe ⁺	451
H ₃ FSi ⁺	307
H ₃ F ₂ ⁺	269
H ₃ GeBr ⁺	481

H ₃ GeI ⁺	517
H ₃ N ⁺	123
H ₃ N ⁺²	123
H ₃ NF ₄ SiP ₂ ⁺	326
H ₃ NO ⁺	226
H ₃ NOSiS ⁺	368
H ₃ N ₂ ⁺	124
H ₃ N ₃ Ge ⁺	451
H ₃ N ₃ Si ⁺	303
H ₃ O ⁺	172
H ₃ P ⁺	310
H ₃ S ⁺	327
H ₃ Sb ⁺	504
H ₃ Si ⁺	292
H ₃ SiBr ⁺	476
H ₃ SiCl ⁺	394
H ₃ SiI ⁺	514
H ₃ F ₂ ⁺	269
H ₃ Ge ⁺	449
H ₃ N ⁺	123
H ₃ AlCl ₄ ⁺	393
H ₄ N ₂ ⁺	124
H ₄ N ₄ ⁺	124
H ₄ O ₂ ⁺	172
H ₄ P ₂ ⁺	310
H ₄ SGe ⁺	452
H ₄ Si ⁺	292
H ₄ SiS ⁺	367
H ₄ Sn ⁺	497
H ₅ B ₃ ⁺	43
H ₅ B ₃ F ₃ P ⁺	321
H ₅ N ₂ F ₂ P ⁺	322
H ₅ PCe ⁺	452
H ₅ SiP ⁺	325
H ₅ Si ₂ ⁺	293
H ₆ BN ⁺	124
H ₆ B ₃ ⁺	43
H ₆ B ₃ N ₃ ⁺	124
H ₆ Ge ₂ Se ⁺	462
H ₆ Ge ₂ Te ⁺	508
H ₆ NF ₂ SiP ⁺	326
H ₆ N ₃ OP ⁺	319
H ₆ OGe ₂ ⁺	451
H ₆ OSi ₂ ⁺	305
H ₆ SGe ₂ ⁺	452
H ₆ Si ₂ ⁺	293
H ₆ Si ₂ S ⁺	367
H ₆ Si ₂ Se ⁺	461
H ₆ Si ₂ Te ⁺	507
H ₈ B ₄ ⁺	43
H ₈ B ₃ ⁺	43
H ₈ B ₃ Br ⁺	463
H ₈ B ₃ Cl ⁺	371
H ₈ B ₃ I ⁺	509
H ₈ B ₃ SBr ⁺	477
H ₈ Si ₃ ⁺	293
H ₉ B ₃ ⁺	43
H ₉ B ₃ S ⁺	327
H ₉ NGe ₃ ⁺	451
H ₉ NSi ₃ ⁺	303
H ₉ PCe ₃ ⁺	452
H ₉ Si ₃ As ⁺	456
H ₉ Si ₃ P ⁺	325
H ₁₀ B ₄ ⁺	43
H ₁₀ B ₆ ⁺	44
H ₁₀ Si ₄ ⁺	293
H ₁₁ B ₃ ⁺	43
H ₁₁ B ₃ Si ⁺	293
H ₁₁ B ₃ S ⁺	327
H ₁₁ B ₁₁ S ⁺	327

$H_{12}B_3Al^+$	291	K_2^+	403
$H_{12}B_6^+$	44	K_4^+	403
$H_{12}Si_4^+$	293	K_4^+	403
$H_{14}B_{10}^+$	44	K_5^+	403
$H_{16}B_4Hf^+$	531	K_7^+	403
$H_{16}B_4U^+$	554	K_8^+	403
$H_{16}B_4Zr^+$	483	Kr^+	481
Hf^+	531	Kr^{+2}	481
Hg^+	545	$KrXe^+$	520
Hg_2^+	545	Kr_2^+	481
Hg_3^+	545	La^+	522
Hg_4^+	545	$LaAu^+$	545
Hg_5^+	546	$LaIr^+$	543
Hg_6^+	546	Li^+	42
Hg_7^+	546	$LiBi^+$	552
Hg_8^+	546	$LiBr^+$	463
Hg_9^+	546	$LiCH_4^+$	120
Hg_{10}^+	546	$LiCl^+$	370
Hg_{11}^+	546	LiI^+	509
Hg_{12}^+	546	LiK^+	404
Ho^+	529	$LiNa^+$	289
$HoAu^+$	545	LiO^+	172
Ho_2^+	529	$LiOSi^+$	305
I^+	508	$LiPb^+$	550
ICe^+	524	Li_2^+	42
ICe^{+2}	524	$Li_2Br_2^+$	463
ICs^+	521	$Li_2C_4H_9^+$	120
IDy^+	529	$Li_2Cl_2^+$	370
IEr^+	530	$Li_2I_2^+$	509
IEu^+	527	Li_2O^+	172
IGd^+	528	Li_3^+	42
IHo^+	529	Li_3C^+	120
INd^+	526	$Li_3Cl_3^+$	371
IPr^+	525	$Li_3C_4H_9^+$	121
ISm^+	526	$Li_3C_6H_{18}^+$	121
ITb^+	528	$Li_3C_{12}H_{27}^+$	121
ITl^+	549	$Li_3C_{16}H_{36}^+$	121
ITm^+	530	Lu^+	531
I_2^+	508	Mg^+	290
I_2^{+2}	508	$MgCl_2^+$	393
I_2Ba^+	522	MgI_2^+	514
I_2Ce^+	524	Mn^+	420
I_2Dy^+	529	MnI^+	516
I_2Er^+	530	$MnSe^+$	462
I_2Eu^+	527	Mn_2^+	421
I_2Gd^+	528	Mo^+	485
I_2Ho^+	529	Mo_2^+	485
I_2Nd^+	526	N^+	122
I_2Pb^+	551	N^{+2}	122
I_2Pr^+	525	NCe^+	523
I_2Sm^+	526	NCl_3^+	377
I_2Tb^+	528	NF^+	278
I_2Tm^+	530	NFS^+	366
I_3Ce^+	524	NF_2^+	279
I_3Dy^+	529	NF_3^+	279
I_3Er^+	530	NF_3S^+	366
I_3Gd^+	528	$NF_5P_2^+$	322
I_3Ho^+	529	$NF_6P_3^+$	322
I_3Nd^+	526	NGe_2^+	451
I_3Pr^+	525	NHf^+	531
I_3Tb^+	528	NO^+	225
I_3Tm^+	530	NO^{+2}	225
I_4Hf^+	531	$NOBr^+$	472
In^+	496	$NOCl^+$	385
InI^+	518	NOF^+	287
InI_3^+	519	NOF_3^+	287
Ir^+	543	$NOSi_2^+$	306
K^+	403	NO_2^+	225
KBr^+	480	NO_2Cl^+	385
KI^+	515	NO_2F^+	287

NO_3Cs^+	520	OAlSi^+	309
NO_3Cs_2^+	520	OAl_2^+	291
NO_3K^+	404	OBa^+	521
NO_3Rb^+	482	OBr^+	470
NO_3Ti^+	548	OBrW^+	540
NP^+	315	OBr_2W^+	540
NS^+	343	OBr_3W^+	540
NSCl^+	400	OBr_4W^+	540
NS_2^+	343	OCa^+	405
NSiGe^+	452	OCe^+	523
NSi_2^+	303	OCl^+	382
NV^+	407	OCIV^+	408
N_2^+	122	OCl_2^+	382
N_2F^+	279	OCl_2V^+	409
N_2F_2^+	279	OCl_3V^+	409
N_2F_3^+	279	OCs_2^+	520
N_2O^+	225	ODy^+	529
N_2O^{+2}	225	OEr^+	530
N_2O_1^+	226	OEu^+	527
N_2O_3^+	226	OEu_2^+	527
$\text{N}_2\text{O}_4\text{Cu}^+$	445	OF^+	283
N_2S_2^+	343	OFAl^+	292
N_3Br^+	468	OFV^+	408
N_3Cl^+	377	OF_2^+	283
$\text{N}_3\text{F}_6\text{P}_3^+$	322	OF_2Al^+	292
$\text{N}_3\text{O}_9\text{Co}^+$	439	OF_2Ge^+	452
$\text{N}_3\text{O}_{10}\text{V}^+$	408	OF_2S^+	366
$\text{N}_3\text{P}_3\text{Cl}_6^+$	397	OF_2V^+	408
N_3S_3^+	343	OF_3Mo^+	487
$\text{N}_4\text{O}_2\text{Ti}^+$	406	OF_4P^+	324
N_4S_4^+	343	OF_3V^+	408
Na^+	289	OF_1P_2^+	324
NaAg^+	493	OF_4Xe^+	520
NaAu^+	544	OF_5Re^+	541
NaBr^+	475	OFe^+	430
NaCl^+	393	OGd^+	527
NaCl_3Gd^+	528	OGd_2^+	528
NaI^+	514	OGe^+	451
NaK^+	404	OHf^+	531
NaK_2^+	404	OHo^+	529
Na_2^+	289	OHo_2^+	529
Na_2Cl_2^+	393	OIn_2^+	496
Na_2K^+	404	OK^+	404
Na_2K_2^+	404	OK_2^+	404
Na_3^+	289	OLa^+	522
Na_3K^+	404	OLu^+	531
Na_4^+	289	OLu_2^+	531
Na_4K^+	404	ONa^+	290
Na_5^+	289	ONaP^+	324
Na_5K^+	405	ONd^+	526
Na_6^+	289	ONp^+	555
Na_7^+	289	OP^+	316
Na_8^+	289	OPBr_3^+	477
Na_9^+	289	OPCl^+	397
Na_{10}^+	289	OPCl_4^+	397
Na_{11}^+	289	OPb^+	550
Na_{12}^+	289	OPr^+	525
Na_{13}^+	289	ORe^+	540
Na_{14}^+	289	OS^+	351
Nb^+	484	OSBr_2^+	478
Nd^+	525	OSBr_3^+	479
Ne^+	288	OSCl_2^+	401
Ne^{+2}	289	OSCl_3^+	401
Ni^+	441	OSU^+	555
No^+	555	OS_2^+	351
Np^+	555	$^{18}\text{OSi}^+$	352
O^+	170	OSm^+	526
O^{+2}	170	OSn^+	500
OAl^+	291	OSr^+	483
OAlCl^+	393	OTa^+	532

OTb ⁺	528	O ₁ W ₂ ⁺	533
OTb ₂ ⁺	528	O ₁ BaRe ⁺	542
OTe ⁺	507	O ₁ CsRe ⁺	542
OTh ⁺	553	O ₁ KRe ⁺	542
OTi ⁺	406	O ₁ MoCs ₂ ⁺	521
OTi ⁺	548	O ₁ NaRe ⁺	541
OTl ₂ ⁺	548	O ₁ Na ₂ Mo ⁺	487
OTm ⁺	530	O ₁ Os ⁺	542
OU ⁺	554	O ₁ P ₂ ⁺	317
OV ⁺	408	O ₁ RbRe ⁺	542
OY ⁺	483	O ₁ ReTl ⁺	549
OYb ⁺	530	O ₁ Ru ⁺	490
OZr ⁺	484	O ₁ STl ₂ ⁺	548
O ₂ ⁺	170	O ₁ W ₂ ⁺	533
O ₂ ²⁺	171	O ₃ P ₂ ⁺	317
O ₂ Al ⁺	291	O ₃ Re ₂ ⁺	541
O ₂ Al ₂ ⁺	291	O ₃ VW ⁺	539
O ₂ BrW ⁺	540	O ₂ W ₂ ⁺	533
O ₂ Br ₂ W ⁺	540	O ₆ As ₄ ⁺	455
O ₂ Ce ⁺	523	O ₆ P ₃ ⁺	317
O ₂ Ce ₂ ⁺	523	O ₆ P ₄ ⁺	317
O ₂ Cl ⁺	382	O ₆ Re ₂ ⁺	541
O ₂ Cl ₂ Cr ⁺	420	O ₆ Sb ₂ ⁺	505
O ₂ Cl ₂ Mo ⁺	489	O ₁ W ₂ ⁺	533
O ₂ Eu ₂ ⁺	527	O ₇ P ₃ ⁺	317
O ₂ FS ⁺	366	O ₇ P ₄ ⁺	317
O ₂ F ₂ S ⁺	366	O ₇ Re ₂ ⁺	541
O ₂ Fe ⁺	430	O ₈ P ₄ ⁺	317
O ₂ Gd ⁺	528	O ₈ VW ₂ ⁺	539
O ₂ Gd ₂ ⁺	528	O ₈ V ₄ ⁺	408
O ₂ Ge ₂ ⁺	451	O ₈ W ₃ ⁺	533
O ₂ Hf ⁺	531	O ₈ P ₄ ⁺	317
O ₂ Ho ₂ ⁺	529	O ₁ V ₂ W ₂ ⁺	539
O ₂ IW ⁺	540	O ₉ W ₃ ⁺	533
O ₂ I ₂ W ⁺	540	O ₁₀ P ₄ ⁺	317
O ₂ NaP ⁺	324	O ₁₀ V ₂ W ₂ ⁺	539
O ₂ P ⁺	317	O ₁₀ V ₃ W ⁺	539
O ₂ PAg ⁺	493	O ₁₀ V ₄ ⁺	408
O ₂ Pb ⁺	550	O ₁₁ VW ₃ ⁺	539
O ₂ Re ⁺	540	O ₁₁ W ₄ ⁺	533
O ₂ S ⁺	351	O ₁₂ W ₄ ⁺	533
O ₂ SCl ⁺	401	O ₁₃ V ₂ W ₁₃ ⁺	539
O ₂ SCl ₂ ⁺	401	O ₁₃ V ₃ W ₂ ⁺	539
O ₂ SFCl ⁺	401	Os ⁺	542
O ₂ Se ⁺	460	P ⁺	309
O ₂ Ta ⁺	532	PAs ⁺	456
O ₂ Tb ⁺	528	PAs ₂ ⁺	457
O ₂ Te ⁺	507	PBr ⁺	477
O ₂ Th ⁺	553	PBr ₂ ⁺	477
O ₂ Ti ⁺	406	PBr ₂ ⁺	477
O ₂ U ⁺	554	PCI ⁺	396
O ₂ V ⁺	408	PClBr ⁺	479
O ₂ W ⁺	533	PClBr ₂ ⁺	480
O ₂ Zr ⁺	484	PCI ₂ ⁺	396
O ₃ ⁺	171	PCl ₂ Br ⁺	479
O ₃ ClMn ⁺	428	PCI ₂ ⁺	396
O ₃ FCl ⁺	392	PCI ₃ ⁺	396
O ₃ FMn ⁺	423	PCI ₅ ⁺	396
O ₃ FRe ⁺	541	PI ₃ ⁺	514
O ₃ FS ⁺	366	PS ⁺	368
O ₃ IRe ⁺	542	PSBr ₃ ⁺	479
O ₃ MoCs ₂ ⁺	521	PSCl ₃ ⁺	402
O ₃ NaP ⁺	325	PSb ⁺	505
O ₃ PCs ⁺	520	PSe ⁺	461
O ₃ PK ⁺	405	PTe ⁺	507
O ₃ PRb ⁺	482	P ₂ ⁺	309
O ₃ P ₂ ⁺	317	P ₂ As ₂ ⁺	457
O ₃ Re ⁺	541	P ₂ Rh ⁺	491
O ₃ S ⁺	351	P ₃ ⁺	310
O ₃ U ⁺	554	P ₃ As ⁺	457
		P ₄ ⁺	310

P_4S^+	368	Se_2^+	458
$P_4S_2^+$	368	Se_4^+	458
$P_4S_3^+$	368	Se_6^+	458
$P_4S_4^+$	368	Si^+	292
$P_4S_5^+$	368	$SiBr^+$	476
$P_4S_6^+$	368	$SiBr_2^+$	476
$P_4S_7^+$	368	$SiBr_3^+$	476
$P_4S_8^+$	368	$SiBr_4^+$	476
$P_4S_9^+$	368	$SiCl^+$	393
$P_4S_{10}^+$	368	$SiCl_2^+$	393
$P_4Se_3^+$	461	$SiCl_3Co^+$	441
Pa^+	553	$SiCl_3^+$	394
Pb^+	549	$SiCl_3Co^+$	441
Pd^+	492	$SiCl^+$	394
$PdCe^+$	524	SiP^+	325
Pm^+	526	SiP_2^+	325
Pr^+	524	$Si_2Cl_4^+$	394
Pt^+	543	Si_2P^+	325
$PtTh^+$	553	Sm^+	526
Pu^+	555	Sn^+	497
Rb^+	482	SnI_4^+	519
RbI^+	517	$SnTe^+$	508
Rb_2^+	482	Sr^+	483
Rb_2I^+	517	Sr^{+2}	483
Re^+	540	SrI^+	517
Rh^+	490	SrI_2^+	517
$RhCe^+$	524	Ta^+	532
$RhLa^+$	523	Tb^+	528
Rh_2^+	491	$TePb^+$	551
Ru^+	490	Te_2^+	506
$RuTh^+$	553	Te_3^+	506
RuU^+	555	Te^+	506
S^+	326	Te_5^+	506
SBr_2^+	477	Te_6^+	506
SCe^+	524	Th^+	552
SCl^+	399	Ti^+	405
SCl_2^+	399	$TiBr_4^+$	480
SEu^+	527	TiI_4^+	515
SEu_2^+	527	$TiPt^+$	544
SGa^+	448	$TiRh^+$	492
SGa_2^+	448	Ti_2Rh^+	492
SGd^+	528	Tl^+	548
SGe^+	452	$TlBi^+$	552
SSe^+	461	Tl_2^+	548
SSn^+	501	Tm^+	530
STi^+	407	U^+	553
SV^+	408	U^{+2}	553
SY^+	483	V^+	407
S_2^+	326	V^{+5}	407
$S_2Br_2^+$	477	W^+	532
S_2Ce^+	524	Xe^+	519
S_2Cl^+	399	Xe^{+2}	519
$S_2Cl_2^+$	399	Xe_2^+	519
S_2Eu^+	527	Y^+	483
$S_2Eu_2^+$	527	YRh^+	492
$S_3As_3^+$	457	Yb^+	530
$S_3As_4^+$	457	Yb^{+2}	530
$S_4As_4^+$	457	Yb_2^+	530
S_8^+	326	Zn^+	446
Sb^+	504	$ZnBr_2^+$	481
SbI_3^+	519	ZnI_2^+	516
Sb_2^+	504	Zr^+	483
Sb_4^+	504	ZrI_4^+	518
Sb_4^+	504		
Sc^+	405		
$ScRh^+$	492		
Se^+	458		
$SeBr_2^+$	481		
$SeSn^+$	503		
$SeTe^+$	508		

Table of Ion Energetics Measurements

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
H⁺	H ₂ ⁺ (² Σ _g ⁺)	1333-74-0	H	18.0±0.2	EI	3799
	CH ₄	74-82-8	CH ₃	21.3±0.3	EI	5205
				24.0±0.5	EI	3521
	C ₂ H ₂	74-86-2		20.6±0.3	EI	4876
	C ₂ H ₆	74-84-0		23.5±0.5	EI	4911
	H ₂ O	7732-18-5	OH	16.95±0.05	EI	5046
			OH(X ² Π)	18.7±0.05	EI	3906
	HCHO	50-00-0	HCO	17.41±0.07	PI	3554
D⁺	CD ₄	59862-12-3	CD ₃	22.17±0.1	EI	5205
	D ₂ O	7789-20-0	OD	18.75±0.05	PE	4247
			OD(X ² Π)	18.7±0.05	EI	3906
H₂⁺ (² Σ _g ⁺)	H ₂	1333-74-0	**	15.42589±0.00005 S	S	3770
			**	15.4	PI	5479
			**	15.38186±0.00031	PE	3531
			**	15.43	PE	4248
			**	15.43	PE	5313
			**	15.5±1	EI	4894
	C ₂ H ₆	74-84-0		35.0±0.5	EI	4911
	HCHO	50-00-0	CO	15.42±0.06	PI	3554
HD⁺	HD	13983-20-5	**	15.44477±0.00007	S	3763
	CH ₃ CD ₃	2031-95-0		38.2±0.8	EI	5128
D₂⁺	D ₂	7782-39-0	**	15.4667±0.0001	S	5140
	CH ₃ CD ₃	2031-95-0		35.2±0.8	EI	5128
Li⁺	Li	7439-93-2	**	5.4	EI	4912
			**	5.5±0.3	EI	5254
	LiF	7789-24-4		~12	EI	3464
	LiCl	7447-41-8	Cl	10.17	PI	5509
Li₂⁺	Li ₂	14452-59-6	**	4.96±0.1	S	3768
			**	5.174±0.013	PI	5143
			**	4.86±0.1	EI	4568
			**	4.86±0.1	EI	5164
			**	5.0±0.3	EI	5254
			**	5.0	EI	4912
Li₃⁺	Li ₃	12596-47-3	**	4.35±0.2	EI	5164
HLi⁺	LiH	7580-67-8	**	7.9±0.3	EI	5254
			**	4.5±0.3	EI	5254
DLi⁺	LiD	13587-16-1	**	7.7±0.1	EI	4568
H₂Li⁺	LiH ₂	19709-52-5	**	6.14±0.2	EI	5254

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
HLi_2^+	Li_2H	12339-13-8	**	4.5 ± 0.3	EI	5254
Be^+	Be	7440-41-7	**	9.2 ± 1.0	EI	4113
HBe^+	BeH	13597-97-2	** **	8.20 ± 0.06 8.21 ± 0.05	S S	4183 5223
B^+	B	7440-42-8	** ** **	8.29808 ± 0.00002 8.0 8.6 ± 0.4	S EI EI	4182 4483 3468
	H_2NBH_2	14720-35-5		19.2 ± 0.05	EI	4522
HB^+	H_2NBH_2	14720-35-5	NH_3	18.0 ± 0.1	EI	4522
H_2B^+	H_2NBH_2	14720-35-5	NH_2	17.2 ± 0.2	EI	4522
H_3B^+	BH_3	13283-31-3	**	11-12	EI	3441
H_5B_3^+	B_3H_7	12429-70-8		11.5 ± 0.3	EI	3652
H_6B_3^+	B_3H_7	12429-70-8	H	11.2 ± 0.3	EI	3652
H_8B_4^+	B_4H_8	12007-71-5	**	10.9 ± 0.3	EI	3652
$\text{H}_{10}\text{B}_4^+$	B_4H_{10} (Tetraborane (10))	18283-93-7	**	10.76 ± 0.04	PE	4454
H_8B_5^+	B_5H_9	19624-22-7	H	11.84 ± 0.01	EI	3547
	1- $\text{B}_3\text{H}_8\text{CH}_3$	19495-55-7	CH_3	10.45 ± 0.02	EI	3547
	2- $\text{B}_3\text{H}_8\text{CH}_3$	23753-74-4	CH_3	10.61 ± 0.05	EI	3547
	1- $\text{B}_3\text{H}_8\text{C}_2\text{H}_5$	23753-61-9	C_2H_5	10.33 ± 0.05	EI	3547
	2- $\text{B}_3\text{H}_8\text{C}_2\text{H}_5$	23753-62-0	C_2H_5	10.31 ± 0.01	EI	3547
	1- $\text{B}_3\text{H}_8\text{C}_3\text{H}_7$	34692-67-6	C_3H_7	10.98 ± 0.01	EI	3547
	1- $\text{B}_3\text{H}_8\text{Cl}$	19469-13-7	Cl	11.75 ± 0.05	EI	3547
	2- $\text{B}_3\text{H}_8\text{Cl}$	19469-14-8	Cl	12.20 ± 0.10	EI	3547
	1- $\text{B}_3\text{H}_8\text{Br}$	23753-67-5	Br	11.38 ± 0.05	EI	3547
	2- $\text{B}_3\text{H}_8\text{Br}$	23753-64-2	Br	11.75 ± 0.05	EI	3547
	1- $\text{B}_3\text{H}_8\text{I}$	30624-33-0	I	10.70 ± 0.05	EI	3547
	2- $\text{B}_3\text{H}_8\text{I}$	20199-87-5	I	10.72 ± 0.05	EI	3547
H_9B_5^+	B_5H_9	19624-22-7	** ** ** **	9.90 9.94 9.87 ± 0.02 10.5 (V)	PE PE PE PE	3869 4446 4454 4949
H_{11}B_5	B_5H_{11} (Pentaborane(11))	18433-84-6	**	10.7 (V)	PE	4949

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$\text{H}_{10}\text{B}_6^+$	B_6H_{10} (Hexaborane(10))	2377-80-2	**	9.4 (V)	PE	4949
$\text{H}_{12}\text{B}_6^+$	B_6H_{12} (Hexaborane(12))	12008-19-4	**	10.2 (V)	PE	4949
$\text{H}_{14}\text{B}_{10}^+$	$\text{B}_{10}\text{H}_{14}$ (Decaborane (14))	17702-41-9	**	9.88 ± 0.03	PE	4454
			**	10.15 (V)	PE	4265
C^+	C	7440-44-0	**	10.5 ± 1.0	EI	3597
			**	10.9 ± 0.4	EI	4206
			**	10.9 ± 0.4	EI	5635
			**	11.2 ± 0.5	EI	4909
			**	11.2 ± 0.5	EI	5169
			**	11.4 ± 1.5	EI	3978
	CH_4	74-82-8		≤ 25.2	EI	3813
	C_2H_2	74-86-2		22.5 ± 0.3	EI	4876
	C_2H_4	74-85-1		24.4	EI	4118
	$\text{CH}_2=\text{CD}_2$	6755-54-0		24.4	EI	4197
	C_2H_6	74-84-0		29.6 ± 0.2	EI	4911
(^2P)	CO	630-08-0	$\text{O}^-(^2\text{P})$	20.89	EI	5126
	CO_2	124-38-9	O_2	25 ± 2	PI	5170
			O_2	22.7 ± 0.2	EI	4693
				24.6 ± 1.0	EI	4129
			2O	27.8 ± 0.1	EI	4693
	CH_3Br	74-83-9	$\text{H} + \text{H}_2 + \text{Br}$	22.9 ± 0.5	EI	4533
C^{+2}						
(^3P)	C^+	14067-05-1	**	31.0	EI	3489
(^1P)			**	37.3	EI	3489
C_2^+						
	C_2	12070-15-4	**	10.9 ± 0.4	EI	4206
			**	11.1 ± 0.5	EI	5169
			**	11.1 ± 1.0	EI	3597
	C_2H_2	74-86-2		19.2 ± 0.2	EI	4876
	C_2H_4	74-85-1		24.5	EI	4118
	$\text{CH}_2=\text{CD}_2$	6755-54-0		24.5	EI	4197
	C_2H_6	74-84-0		31.5 ± 0.2	EI	4911
C_3^+						
	C_3	12075-35-3	**	11.1 ± 0.5	EI	5169
CH^+						
	CH_4	74-82-8	$\text{H}_2 + \text{H}?$	22.4	EI	3813
	C_2H_2	74-86-2		20.9 ± 0.2	EI	4876
	C_2H_4	74-85-1		22.1	EI	4118
	$\text{CH}_2=\text{CD}_2$	6755-54-0		21.9	EI	4197
	C_2H_6	74-84-0		26.7 ± 0.5	EI	4911
	CH_3Br	74-83-9	$\text{H}_2 + \text{Br}$	21.7 ± 0.3	EI	4533
CH_2^+						
	CH_2	60528-76-9	**	10.35 ± 0.15	EI	5365
	CH_4	74-82-8	H_2	15.3	EI	3813
	C_2H_2	74-86-2		20.5 ± 0.2	EI	4876
	C_2H_4	74-85-1	CH_2	18.04 ± 0.04	PI	5130
				18.4	EI	4118

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
CH_2^+	$\text{CH}_2=\text{CD}_2$	6755-54-0		18.4	EI	4197
	C_2H_6	74-84-0		17.3 ± 0.15	EI	4911
	CH_3OH	67-56-1	H_2O	14.05 ± 0.05	PI	3554
	CH_3CHO	75-07-0		15.08 ± 0.09	PI	4350
	$\text{C}_2\text{H}_4\text{O}$ (Oxirane)	75-21-8		14.66 ± 0.09	PI	4350
	$\text{CH}_2=\text{CF}_2$	75-38-7	CF_2	16.99 ± 0.02	PI	3930
			CF_2	17.2 ± 0.1	EI	3539
	CH_3Br	74-83-9	HBr	14.7 ± 0.5	EI	4533
CHD^+	$\text{CH}_2=\text{CD}_2$	6755-54-0		20.0	EI	4197
CD_2^+	$\text{CH}_2=\text{CD}_2$	6755-54-0		18.4	EI	4197
	C_2D_4	683-73-8	CD_2	18.13 ± 0.07	PI	5130
CH_3^+	CH_4	2229-07-4	**	9.81 ± 0.02	PE	3717
			**	9.82 ± 0.02 (V)	PE	4614
			**	9.837 ± 0.005	PE	3942
			**	9.86 ± 0.04 (V)	PE	3695
			**	9.86 ± 0.04	PE	3700
			**	9.84 ± 0.05	EI	4714
			**	9.84 ± 0.02	PE	4899
			**	9.840 ± 0.005 (V)	PE	4596
			**	9.6 ± 0.3	EI	4533
	CH_3	74-82-8	H	14.4	EI	3813
	C_2H_4	74-85-1		19.3	EI	4118
	C_2H_6	74-84-0		14.1 ± 0.1	EI	4911
	$\text{CH}_3\text{C}\equiv\text{CH}$	74-99-7	C_2H	14.6 ± 0.1	EI	3769
			C_2H	16.0	EI	3808
	$\text{C}_2\text{H}_5\text{C}\equiv\text{CH}$	107-00-6	C_3H_3	15.1	EI	3808
	$1-\text{C}_4\text{H}_8$	106-98-9	C_4H_5	14.1	EI	3808
	<i>iso</i> - C_4H_8	115-11-7	C_4H_5	16.4	EI	3808
	$(\text{CH}_3)_3\text{CC}\equiv\text{CH}$	917-92-0	C_5H_7	14.7	EI	3808
	$(\text{CH}_3)_2\text{CCH}=\text{CH}_2$	558-37-2	C_5H_9	15.4	EI	3808
	CH_3NH_2	74-89-5	NH_2	14.5	EI	3808
	$\text{C}_2\text{H}_5\text{NH}_2$	75-04-7	CH_2NH_2	15.6	EI	3808
	$(\text{CH}_3)_2\text{NH}$	124-40-3	CH_3NH	14.8	EI	3808
	$(\text{CH}_3)_3\text{N}$	75-50-3	$(\text{CH}_3)_2\text{N}$	14.9	EI	3808
	$(\text{C}_2\text{H}_5)_2\text{NH}$	109-89-7	$\text{C}_2\text{H}_5\text{NHCH}_2$	15.4	EI	3808
	$(\text{C}_2\text{H}_5)_3\text{N}$	121-44-8	$(\text{C}_2\text{H}_5)_2\text{NCH}_2$	16.7	EI	3808
	<i>trans</i> - $\text{CH}_3\text{N}=\text{NCH}_3$	4143-41-3	CH_3+N_2	11.32 ± 0.05	PI	4342
	CH_3OH	67-56-1	OH	13.82 ± 0.04	PI	3554
	CH_3CHO	75-07-0	$\text{CO}+\text{H}$	14.08 ± 0.05	PI	4350
				14.08	PI	5270
			$\text{CO}+\text{H}$	14.11 ± 0.05	PI	4177
	$\text{C}_2\text{H}_4\text{O}$	75-21-8	$\text{CO}+\text{H}$	13.06 ± 0.05	PI	4350
	(Oxirane)					
	CH_3CDO	4122-13-8		14.26	PI	5270
	$(\text{CH}_3)_2\text{CO}$	67-64-1		15.61	PE	5066
				15.2	EI	3550
	$((\text{CH}_3)_2\text{C}(\text{CN})\text{NO})_2$	31018-29-8		14.60	EI	4809
	$((\text{CH}_3)_2\text{C}(\text{NO})\text{COCH}_3)_2$	30442-79-6		15.70	EI	4809
	$(\text{C}_6\text{H}_{11}\text{NO}_2)_2$	68777-99-1		15.50	EI	4809
	$((\text{CH}_3)_2\text{C}(\text{NO})\text{COOCH}_3)_2$	6144-15-6		14.20	EI	4809
	$((\text{CH}_3)_2\text{C}(\text{NO})\text{OOCCH}_3)_2$	68777-98-0		12.80	EI	4809
	$((\text{CH}_3)_2\text{C}(\text{NO}_2)\text{NO})_2$	5275-46-7		14.20	EI	4809
	$\text{CH}_3(\text{NF}_2)\text{CH}(\text{NF}_2)\text{CH}_3$	15403-25-5		16.4 ± 0.4	EI	3634
	$(\text{CH}_3)_2\text{C}(\text{NF}_2)_2$	19309-63-8		14.7 ± 0.2	EI	3634

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
CH₃⁺	(CH ₃ NF ₂) ₂ CH ₂	21298-22-6	CH ₃ SO	14.6±0.3	EI	3634
	(CH ₃ O) ₂ PO	512-56-1		17.90±0.40	EI	3989
	(CH ₃) ₂ SO	67-68-5		13.3±0.3	EI	5311
	(CH ₃ O) ₂ P(CH ₃ S)O	152-20-5		15.20±0.30	EI	3989
	(CH ₃ O) ₂ P(CH ₃ S)S	2953-29-9		14.50±0.40	EI	3989
	(CH ₃) ₂ CCINO	2421-26-3		13.75	EI	4809
	CH ₃ Br	74-83-9	Br	12.80±0.03	PI	4640
	(CH ₃) ₂ CBrNO	7119-91-7	Br	12.8±0.3	EI	4533
	(CH ₃) ₂ CBrNO	7119-91-7	I	11.95	EI	4809
	CH ₃ I	74-88-4		12.25±0.03	PI	4640
				12.260±0.013	PI	3524
			I	12.07±0.07	EI	3626
CH₂D⁺	CH ₃ CDO	4122-13-8		14.18	PI	5270
CHD₂⁺	CH ₂ =CD ₂	6755-54-0		19.5	EI	4197
	CD ₃ CHO	19901-15-6		14.25	PI	5270
CD₃⁺	CD ₃	17030-72-7	**	9.831±0.007 (V) PE	PE	4596
			**	9.5±0.1	EI	4714
	CD ₃ OD	811-98-3	OD	14.88	PI	5174
	CD ₃ CHO	19901-15-6		14.15	PI	5270
CH₃⁺	CH ₃	74-82-8	**	12.6	PI	5479
			**	12.51	PE	3645
			**	~12.51	PE	3529
			**	12.6	PE	4623
			**	12.64	PE	3716
			**	13.6 (V)	PE	5084
			**	12.8	EI	3813
			**	12.82±0.02	EI	5513
			**	12.94±0.04	EI	5503
	C ₂ H ₆	74-84-0		20.4±0.3	EI	4911
	CH ₃ CHO	75-07-0	CO	12.61±0.06	PI	4350
				12.61	PI	5270
	C ₂ H ₄ O	75-21-8	CO	11.79±0.03	PI	4350
	(Oxirane)					
CH₃D⁺	CH ₃ CDO	4122-13-8		12.76	PI	5270
CHD₃⁺	CD ₃ CHO	19901-15-6		12.77	PI	5270
C₂H⁺	C ₂ H	2122-48-7	**	11.96±0.05	OTH	3931
			**	11.96±0.05	OTH	3929
	C ₂ H ₂	74-86-2	H	17.36±0.01	PI	3931
				17.45±0.1	EI	4876
	C ₂ H ₄	74-85-1		18.7	EI	4118
	CH ₂ =CD ₂	6755-54-0		18.9	EI	4197
	C ₂ H ₆	74-84-0		25.6±0.2	EI	4911
	CH≡CCN	1070-71-9	CN	18.19±0.04	PI	3929
	CHF ₂ C≡CH	18371-25-0	CHF ₂	16.19±0.02	EI	3769
C₂D⁺	C ₂ D ₂	1070-74-2	D	17.44±0.01	PI	3931

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C ₂ H ₂ ⁺	C ₂ H ₂	74-86-2	**	11.394±0.005	PI	4069
			**	11.398±0.005	PI	3921
			**	11.40	PE	4048
			**	11.40	PE	5313
			**	11.403±0.0003	PE	4575
			**	11.43 (V)	PE	4750
			**	11.49 (V)	PE	5084
			**	11.4±0.1	EI	4876
			**	~11.3	EI	4658
			**	11.37±0.05	EI	4714
			**	11.4±0.1	EI	5129
	C ₂ H ₄	74-85-1	H ₂	13.14±0.01	PI	5130
			**	13.55	PI	5018
				13.0±0.1	EI	4922
				13.13±0.04	EI	4922
			H ₂	13.1	EI	4118
			H ₂	13.11±0.02	EI	4320
				13.1	EI	4197
			D ₂	13.27±0.05	EI	4320
				14.7±0.1	EI	4911
			CH ₂	15.2±0.1	EI	3769
			C ₃ H ₆	115-07-1	CH ₄	12.92±0.05
	C ₃ H ₆	75-19-4	CH ₄	12.71±0.06	PI	4350
	(Cyclopropane)					
	((CH ₃) ₂ C(CN)NO) ₂	31018-29-8		16.50	EI	4809
	((CH ₃) ₂ C(CN)OOCCH ₃) ₂	68777-98-0		15.90	EI	4809
	C ₂ H ₃ F	75-02-5	HF	13.51±0.02	PI	3930
				13.51	PI	5352
			HF	13.30	PE	4993
	CH ₂ =CF ₂	75-38-7	2F	19.08±0.03	PI	3930
	cis-CHF=CHF	1630-77-9		18.4±0.2	PI	5241
	trans-CHF=CHF	1630-78-0		18.3±0.2	PI	5241
	C ₂ H ₃ Cl	75-01-4	HCl	12.47±0.1	PI	3930
C ₂ H ₃ Br	593-60-2	HBr	12.5±0.2	PI	5079	
C ₂ HD ⁺	CH≡CD	XXXXX-XX-X	**	11.25±0.1	EI	4714
	CH ₂ =CD ₂	6755-54-0		13.1	EI	4197
	trans-CHD=CHD	1517-53-9	HD	13.16±0.03	EI	4320
C ₂ D ₂ ⁺	C ₂ D ₂	1070-74-2	**	11.404±0.005	PI	3921
			**	11.20±0.1	EI	4714
	trans-CHD=CHD	1517-53-9	H ₂	13.14±0.06	EI	4320
	C ₂ D ₄	683-73-8	D ₂	13.24±0.01	PI	5130
	C ₂ D ₆	1632-99-1	2D ₂	14.8	PE	3919
C ₂ H ₃ ⁺	C ₂ H ₃	2669-89-8	**	8.7±0.1	OTH	3930
	C ₂ H ₄	74-85-1	H	13.22±0.02	PI	5130
			**	13.55	PI	5018
			H	13.31±0.03	EI	4320
			H	13.52±0.04	EI	5503
			H	13.6	EI	4118
	C ₂ H ₆	74-84-0		14.6±0.1	EI	4911
	C ₄ H ₆	115-07-1	CH ₃	13.20±0.04	PI	4350
			CH ₄	13.78±0.03	EI	5244
	C ₆ H ₆	75-19-4	CH ₄	12.64±0.05	PI	4350
	(Cyclopropane)					
	CH ₂ CHCH ₂ CN	109-75-1		12.90	PI	5201
	C ₆ H ₅ NH	109-97-7		13.60	PI	5201

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₂H₃⁺	CH ₃ C(CH ₃)CN	126-98-7		13.20	PI	5201
	C ₃ H ₃ CN (Cyclopropanecarbonitrile)	5500-21-0		12.65	PI	5201
	CH ₃ CHO	75-07-0	OH	14.17±0.13	PI	4350
	C ₂ H ₃ O (Oxirane)	75-21-8	OH	12.92±0.08	PI	4350
	((CH ₃) ₂ C(NO)OOCCH ₃) ₂	68777-98-0		15.30	EI	4809
	((CH ₃) ₂ C(NO ₂)NO) ₂	5275-46-7		14.30	EI	4809
	C ₂ H ₃ F	75-02-5	F	13.84±0.04	PI	3930
			F	13.84	PI	5352
			F	13.85±0.1	PE	4993
	C ₂ H ₃ Cl	75-01-4	Cl	12.48±0.04	PI	3930
			Cl	12.56±0.09	EI	5503
	C ₂ H ₃ Br	593-60-2	Br	11.85±0.1	PI	5079
			Br	12.01±0.13	EI	5503
	(CH ₃) ₂ CBrNO	7119-91-7		14.45	EI	4809
C₂HD₂⁺	CH ₂ =CD ₂	6755-54-0	H	13.2	EI	4197
	<i>trans</i> -CHD=CHD	1517-53-9	H	13.56±0.10	EI	4320
C₂D₃⁺	C ₂ D ₄	683-73-8	D	13.41±0.02	PI	5130
	C ₂ D ₆	1632-99-1	D ₂ +D	14.8	PE	3919
C₂H₄⁺	C ₂ H ₄	74-85-1	**	10.50±0.02	PI	5018
			**	10.507±0.004	PI	4306
			**	10.51	PI	5479
			**	10.517±0.003	PI	5130
			**	10.5 (V)	PE	4225
			**	10.5 (V)	PE	4884
			**	10.50±0.01 (V)	PE	4939
			**	10.51	PE	3649
			**	10.51	PE	3739
			**	10.51	PE	3847
			**	10.51	PE	5408
			**	10.514±0.007	PE	4943
			**	10.515±0.003	PE	3957
			**	10.517±0.002	PE	4494
			**	10.56	PE	3533
			**	10.68 (V)	PE	5084
			**	10.5	EI	4118
			**	~10.5	EI	4671
			**	10.51±0.01	EI	4320
	C ₂ H ₆	74-84-0		12.1±0.1	EI	4911
	C ₃ H ₈	74-98-6	CH ₄	11.52	EI	5284
			CH ₄	11.55	EI	3488
			CH ₄	11.9	EI	3488
	C ₃ H ₄ (=O) (Cyclopropanone)	5009-27-8		10.2±0.1	EI	4689
	C ₄ H ₄ F ₄ (Cyclobutane, 1,1,2,2-tetrafluoro-)	374-12-9	C ₂ F ₄	13.15	EI	4553
C₂H₃D⁺	C ₂ H ₃ D	XXXXXX-XX-X	**	10.518±0.007	PE	4943
C₂H₂D₂⁺	CH ₂ CD ₂	6755-54-0	**	10.529±0.007	PE	4943
			**	10.5	EI	4197
	<i>cis</i> -CHDCHD	2813-62-9	**	10.521±0.007	PE	4943

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_2H_2D_2^+$	<i>trans</i> -CHDCHD	1517-53-9	**	10.525±0.007	PE	4943
			**	10.56±0.03	EI	4320
$C_2HD_3^+$	C_2HD_3	2680-01-5	**	10.518±0.007	PE	4943
			**	10.60±0.03	EI	4320
$C_2D_4^+$	C_2D_4	683-73-8	**	10.528±0.003	PI	5130
			**	10.526±0.007	PE	4943
			**	10.528±0.002	PE	4494
$C_2H_5^+$	C_2H_5	14936-94-8	**	8.39±0.02	PE	4899
	C_2H_6	74-84-0		12.0±0.1	EI	4911
	<i>tert</i> - C_4H_9 , Li_4	25395-78-2		11.±0.50	PI	5455
	$(C_6H_{11}NO_2)_2$	68777-99-1		14.95	EI	4809
	$((CH_3)_2C(NO)OOCCH_3)_2$	68777-98-0		14.20	EI	4809
	$((CH_3)_2C(NO_2)NO)_2$	5275-46-7		13.50	EI	4809
	$C_2H_5SOCH_3$	1669-98-3	CH_3SO	11.8±0.2	EI	5311
	$(C_2H_5)_2SO$	70-29-1	C_2H_5SO	11.9±0.2	EI	5311
	$(CH_3)_2CClNO$	2421-26-3		14.75	EI	4809
	C_2H_5Br	74-96-4	Br	10.72±0.08	EI	3626
	$(CH_3)_2CBrNO$	7119-91-7		13.25	EI	4809
$C_2H_3D_2^+$	CH_3CD_2	28882-22-6	**	8.38±0.02	PE	4899
$C_2H_2D_3^+$	CH_3CD_3	2031-95-0	H	12.2±0.1	EI	5128
$C_2H_6^+$	C_2H_6	74-84-0	**	12.0 (V)	PE	5084
			**	12.00 (V)	PE	4366
			**	11.5±0.1	EI	4911
			**	11.76±0.05	EI	3791
	$(CH_3)_2C(NF_2)_2$	19309-63-8	$NF_3 + CNF?$	13.1±0.2	EI	3634
$C_2H_3D_3^+$	CH_3CD_3	2031-95-0	**	11.5±0.1	EI	5128
C_3H^+	$CH \equiv CCH_3$	74-99-7	$H + H_2$	17.12±0.06	PI	5009
			$H + H_2$	16.6±0.02	PE	5009
			$H_2 + H$	14.0±0.1	EI	3769
	$CH_2 = C = CH_2$	463-49-0	$H_2 + H$	16.9±0.1	PI	5050
	C_3H_4	2781-85-3	$H + H_2$	16.3±0.05	PI	5014
	(Cyclopropene)		$H + H_2$	15.7±0.1	PE	5014
$C_3H_2^+$	$CH \equiv CCH_3$	74-99-7	H_2	13.68±0.04	PI	5009
			H_2	13.0±0.1	PE	5009
			H_2	13.8±0.1	EI	3769
	$CH_2 = C = CH_2$	463-49-0	H_2	13.5±0.2	PI	5050
	C_3H_4	2781-85-3	H_2	12.51±0.04	PI	5014
	(Cyclopropene)					
	$CH \equiv CC \equiv CCH_3$	4911-55-1	H_2	12.15±0.1	PE	5014
			C_2H_2	12.3	PI	5404

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_3H_3^+$	$CH \equiv CCH_3$	74-99-7	H	11.58 ± 0.04	PI	5009
			H	11.2 ± 0.1	PE	5009
			H	11.9 ± 0.1	EI	3769
	$CH_2 = C = CH_2$	463-49-0	H	11.48 ± 0.02	PI	5050
			H	11.595 ± 0.01	PI	5106
	C_3H_4 (Cyclopropene)	2781-85-3	H	10.59 ± 0.04	PI	5014
			H	10.25 ± 0.1	PE	5014
			H	10.9 ± 0.1	EI	4689
	C_4H_6	115-07-1	$H_2 + H$	13.19 ± 0.05	PI	4350
				14.21 ± 0.09	EI	5244
	C_5H_6 (Cyclopropane)	75-19-4	$H_2 + H^-$	12.1 ± 0.1	PI	4350
				12.86 ± 0.1	PI	4350
	$C_2H_5C \equiv CH$	107-00-6	CH_3	11.7	EI	3808
	C_6H_6 (Benzene)	71-43-2	C_3H_3	13.79	PI	4075
				16.90	PE	4630
				15.34 ± 0.06	EI	4534
	CH_2CHCH_2CN	109-75-1		12.10	PI	5201
	$CH_3C(CH_3)CN$	126-98-7		12.30	PI	5201
	C_3H_5CN (Cyclopropanecarbonitrile)	5500-21-0		11.80	PI	5201
				12.60	PI	5201
	C_4H_4NH (1H-Pyrrole)	109-97-7		15.2	EI	3674
				18.6	EI	3674
	$(C_2H_5)_2NCH = CHC \equiv CH$	1809-53-6		11.55 ± 0.10	PE	5289
	$CH_3COC \equiv CH$	1423-60-5	CHO	12.10 ± 0.10	PE	5289
	C_4H_4O (Furan)	110-00-9	CHO	13.90	EI	4809
				14.30	EI	4809
				14.05	EI	4809
	C_4H_4S (Thiophene)	110-02-1	CHS	13.06 ± 0.05	PE	5283
				11.00	EI	5282
	$CH_2ClC \equiv CH$	624-65-7	Cl	10.98	EI	5282
	$CH_3C \equiv CCl$	7747-84-4	Cl	14.35	EI	4809
	$(CH_3)_2CClNO$	2421-26-3		10.88	EI	5282
	$CH_2BrC \equiv CH$	106-96-7	Br	10.90	EI	5282
	$CH_3C \equiv CBr$	2003-82-9	Br	13.80	EI	4809
	$(CH_3)_2CBrNO$	7119-91-7		10.70	EI	5282
	$CH_3C \equiv CI$	624-66-8	I	10.50	EI	5282
	$CH_2IC \equiv CH$	659-86-9	I			
$C_3H_4^+$	$CH_3C \equiv CH$	74-99-7	**	10.37 ± 0.01	PI	5009
			**	10.36 (V)	PE	4847
			**	10.364 ± 0.005	PE	4575
			**	10.37	PE	4048
			**	10.38 ± 0.01	PE	5009
			**	10.54 (V)	PE	5084
			**	10.5 ± 0.1	EI	3769
			**	10.017 ± 0.003	S	3774
	$CH_2 = C = CH_2$	463-49-0	**	9.696 ± 0.002	PE	5050
			**	10. (V)	PE	4931
			**	10.02 (V)	PE	5105
			**	10.07 (V)	PE	4019
			**	9.691 ± 0.004	PI	4807
			**	9.67 ± 0.01	PI	5014
			**	9.668 ± 0.005	PE	5014
	C_3H_4 (Cyclopropene)	2781-85-3	**			
			**			

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_3H_4^+$	C_3H_4	2781-85-3	**	9.67	PE	3727
			**	9.82 (V)	PE	4669
			**	9.86 (V)	PE	3505
			**	9.86 (V)	PE	4267
			**	9.7±0.1	EI	4689
	C_3H_6	115-07-1	H_2	11.91±0.03	PI	4350
	C_3H_6 (Cyclopropane)	75-19-4	H_2	11.64±0.15	PI	4350
	CH_2CHCH_2CN	109-75-1		11.50	PI	5201
	$CH_2C(CH_3)CN$	126-98-7		11.75	PI	5201
	C_3H_5CN (Cyclopropanecarbonitrile)	5500-21-0		11.20	PI	5201
	C_3H_5NH (1H-Pyrrole)	109-97-7		12.00	PI	5201
	$CH_3COC\equiv CH$	1423-60-5	CO	10.68±0.05	PE	5289
	C_3H_4O (Furan)	110-00-9	CO	11.60±0.10	PE	5289
	$((CH_3)_2C(CN)NO)_2$	31018-29-8		12.50	EI	4809
	$(C_6H_{11}NO_2)_2$	68777-99-1		15.55	EI	4809
	$((CH_3)_2C(NO)OOCCH_3)_2$	68777-98-0		12.00	EI	4809
	$((CH_3)_2C(NO_2)NO)_2$	5275-46-7		14.60	EI	4809
	$(CH_3)_2CCINO$	2421-26-3		11.95	EI	4809
	$(CH_3)_2CBrNO$	7119-91-7		11.80	EI	4809
$C_3H_5^+$	$CH_2=CHCH_2$	1981-80-2	**	8.13±0.02 ^a	PE	4722
			**	8.13±0.02	PE	4898
	C_3H_6	115-07-1	H	11.78	PI	4369
			H	11.88±0.03	PI	4350
			H	11.90±0.05	EI	5244
	C_3H_6 (Cyclopropane)	75-19-4	H^+	10.74±0.09	PI	4350
			H	11.44±0.05	PI	4350
			H	11.47	PI	4369
	1- C_4H_8	106-98-9	CH_4	11.8	EI	3808
	<i>iso</i> - C_4H_8	115-11-7	CH_4	11.8	EI	3808
	C_4H_8 (Cyclopropane, methyl-)	594-11-6	CH_4	10.9	EI	3493
	$CH\equiv C(CH_2)_3CH_3$	693-02-7		14.09±0.05	EI	3585
	$CH_3C\equiv CCH_2CH_2CH_3$	764-35-2		13.9±0.01	EI	3585
	C_6H_{10} (Cyclohexene)	110-83-8		13.68±0.05	EI	3585
	$C_5H_8=CH_2$ (Cyclopentane, methylene-)	1528-30-9	C_3H_5	10.2	EI	5586
				14.05±0.05	EI	3585
	$C_5H_7CH_3$ (Cyclopentene, 1-methyl-)	693-89-0		14.90±0.1	EI	3585
			C_3H_7	13.7	EI	5586
	$(CH_3)_2NCH_2CH=CH_2$	2155-94-4	C_2H_6N	9.55	PI	5543
	$((CH_3)_2C(CN)NO)_2$	31018-29-8		10.85	EI	4809
	$(C_6H_{11}NO_2)_2$	68777-99-1		12.95	EI	4809
	$((CH_3)_2C(NO)OOCCH_3)_2$	68777-98-0		11.80	EI	4809
	$((CH_3)_2C(NO_2)NO)_2$	5275-46-7		11.40	EI	4809
	$(C_2H_5)_2S$	352-93-2	$CH_3SH + H$	12.41±0.05	PI	4025
	$C_3H_6S_2$ (1,3-Dithiolane)	4829-04-3	S_3H	10.8±0.2	EI	3598
	<i>(iso</i> - C_3H_7)SOCH ₃	XXXXX-XX-X		12.4±0.1	EI	5311
	<i>n</i> - C_3H_7Cl	540-54-5	$H_2 + Cl$	12.41	PI	5069
	<i>iso</i> - C_3H_7Cl	75-29-6	$H_2 + Cl$	12.58	PI	5069
	$(CH_3)_2CCINO$	2421-26-3		11.75	EI	4809
	<i>n</i> - C_3H_7Br	106-94-5	$H_2 + Br$	11.86	PI	5069

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_3H_5^+$	<i>iso</i> -C ₃ H ₇ Br	75-26-3	H ₂ + Br	11.98	PI	5069
				12.23±0.06	EI	4971
	CH ₂ =CHCH ₂ CH ₂ Br	5162-44-7	CH ₂ Br	12.6	EI	5633
	CH ₂ =CH(CH ₂) ₃ Br	1119-51-3		12.2	EI	5633
	C ₆ H ₁₁ Br	108-85-0		12.52±0.05	PI	4078
	(Cyclohexane, bromo-)					
	(CH ₃) ₂ CBrNO	7119-91-7		11.15	EI	4809
	<i>n</i> -C ₃ H ₇ I	107-08-4	H ₂ + I	11.23	PI	5069
	<i>iso</i> -C ₃ H ₇ I	75-30-9	H ₂ + Br	11.34	PI	5069
				11.67±0.06	EI	4971
$C_3H_6^+$	C ₃ H ₆	115-07-1	**	9.73±0.01	PI	4350
			**	9.73±0.02	PI	5018
			**	9.70 (V)	PE	4285
			**	9.72	PE	3864
			**	9.74	PE	3533
			**	9.744±0.003	PE	3957
			**	9.86 (V)	PE	3950
			**	9.9 (V)	PE	3940
			**	9.91±0.01 (V)	PE	4939
			**	10.03 (V)	PE	4513
			**	10.2 (V)	PE	4225
			**	10.2 (V)	PE	4884
			**	9.69±0.09	EI	5244
	C ₃ H ₆	75-19-4	**	9.91±0.03	PI	4350
	(Cyclopropane)					
			**	10.3±0.1	EI	4689
	<i>n</i> -C ₄ H ₁₀	106-97-8	CH ₄	11.06	EI	3538
			CH ₄	11.15	EI	5284
	<i>iso</i> -C ₄ H ₁₀	75-28-5	CH ₄	10.89±0.02	PI	5025
			CH ₄	10.91	EI	5284
	(CH ₃) ₂ C=CHCH ₂	513-35-9	C ₂ H ₄	11.70±0.11	EI	3544
	(CH ₃) ₂ CHCH=CH ₂	563-45-1	C ₂ H ₄	11.54±0.10	EI	3544
	C ₂ H ₃ C(CH ₃)=CH ₂	563-46-2	C ₂ H ₄	11.66±0.06	EI	3544
	1-C ₅ H ₁₀	109-67-1	C ₂ H ₄	11.61±0.08	EI	3544
	<i>cis</i> -2-C ₅ H ₁₀	627-20-3	C ₂ H ₄	11.54±0.02	EI	3544
	<i>trans</i> -2-C ₅ H ₁₀	646-04-8	C ₂ H ₄	11.73±0.11	EI	3544
	C ₅ H ₁₀	287-92-3	C ₂ H ₄	11.45	EI	4319
	(Cyclopentane)					
			C ₂ H ₄	11.74±0.07	EI	3544
	C ₆ H ₁₂	110-82-7	C ₃ H ₆	11.23±0.04	PI	4078
	(Cyclohexane)					
	(tert-C ₄ H ₉) ₃ Li ₄	25395-78-2		11.±0.50	PI	5455
	(CH ₃) ₂ NCH ₂ C≡CH	7223-38-3	C ₂ H ₃ N	9.39	PI	5543
	(CH ₃) ₂ NCH ₂ CH=CH ₂	2155-94-4	C ₂ H ₃ N	9.58	PI	5543
	<i>n</i> -C ₃ H ₇ OH	71-23-8	H ₂ O	10.3	EI	3916
			H ₂ O	10.33±0.03	EI	3626
	C ₄ H ₆ O	1191-95-3	CO	9.85±0.15	EI	3794
	(Cyclobutanone)					
	<i>n</i> -C ₄ H ₉ CHO	110-62-3	C ₂ H ₃ O	11.90	EI	5264
	<i>sec</i> -C ₅ H ₁₁ CHO	123-15-9	C ₃ H ₆ O	11.00	EI	5264
	<i>iso</i> -C ₆ H ₁₃ NO	920-40-1		10.8±0.1	EI	3654
	((CH ₃) ₂ C(CN)NO) ₂	31018-29-8		11.35	EI	4809
	(C ₆ H ₁₁ NO ₂) ₂	68777-99-1		11.30	EI	4809
	((CH ₃) ₂ C(NO)OOCCH ₃) ₂	68777-98-0		10.70	EI	4809
	((CH ₃) ₂ C(NO ₂)NO) ₂	5275-46-7		11.20	EI	4809
	<i>n</i> -C ₃ H ₇ Cl	540-54-5	HCl	10.82	PI	5069
	(CH ₃) ₂ CCINO	2421-26-3		11.35	EI	4809
	(CH ₃) ₂ CBrNO	7119-91-7		11.15	EI	4809

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$\text{C}_3\text{H}_5\text{D}^+$	$(\text{CH}_3)_3\text{CD}$	13183-68-1	CH_4	10.89 ± 0.02	PI	5025
$\text{C}_3\text{H}_4\text{D}_2^+$	$(\text{CD}_3)_2\text{CH}_3\text{CH}$	XXXXX-XX-X	CD_4	10.97 ± 0.02	PI	5025
$\text{C}_3\text{H}_3\text{D}_3^+$	$(\text{CD}_3)_2\text{CH}_3\text{CH}$	XXXXX-XX-X	CD_3H	10.97 ± 0.02	PI	5025
C_3HD_5^+	$(\text{CD}_3)_2\text{CH}_3\text{CH}$	XXXXX-XX-X	CH_3D	10.89 ± 0.02	PI	5025
C_3D_6^+	$\text{CD}_3\text{CH}_2\text{CD}_3$	2875-96-9	**	~ 12	PI	5615
C_3H_7^+	<i>iso</i> - C_3H_7	19252-53-0	**	7.36 ± 0.02	PE	4899
	<i>n</i> - C_4H_{10}	106-97-8	CH_3	11.09	EI	3538
			CH_3	11.2	EI	5284
	<i>iso</i> - C_4H_{10}	75-28-5	CH_3	11.16 ± 0.02	PI	5025
	C_6H_{12}	110-82-7	C_3H_5	11.49 ± 0.03	PI	4078
	(Cyclohexane)					
	$(\text{C}_6\text{H}_{11}\text{NO}_2)_2$	68777-99-1		10.40	EI	4809
	$((\text{CH}_3)_2\text{C}(\text{NO})\text{OOCCH}_3)_2$	68777-98-0		10.20	EI	4809
	$((\text{CH}_3)_2\text{C}(\text{NO}_2)\text{NO})_2$	5275-46-7		11.40	EI	4809
	<i>(iso</i> - C_7H_7) SOCH_3	XXXXX-XX-X	CH_3SO	10.60 ± 0.11	EI	5311
	<i>(iso</i> - C_7H_7) $_2\text{SO}$	2211-89-4	<i>iso</i> - $\text{C}_3\text{H}_7\text{SO}$	11.57 ± 0.04	EI	5311
	<i>n</i> - $\text{C}_3\text{H}_7\text{Cl}$	540-54-5	Cl	11.07	PI	5069
	<i>iso</i> - $\text{C}_3\text{H}_7\text{Cl}$	75-29-6	Cl	10.92	PI	5069
			Cl	$11.3 \pm < 0.1$	EI	3735
	<i>n</i> - $\text{C}_3\text{H}_7\text{Br}$	106-94-5	Br	10.46	PI	5069
	<i>iso</i> - $\text{C}_3\text{H}_7\text{Br}$	75-26-3	Br	10.33	PI	5069
			Br	$10.7 \pm < 0.1$	EI	3735
	$(\text{CH}_3)_2\text{CBrNO}$	7119-91-7		11.25	EI	4809
	<i>n</i> - $\text{C}_7\text{H}_7\text{I}$	107-08-4	I	9.80	PI	5069
	<i>iso</i> - $\text{C}_7\text{H}_7\text{I}$	75-30-9	I	9.70	PI	5069
			I	$10.0 \pm < 0.1$	EI	3735
$\text{C}_3\text{H}_6\text{D}^+$	$(\text{CH}_3)_3\text{CD}$	13183-68-1	CH_3	11.16 ± 0.02	PI	5025
$\text{C}_3\text{H}_4\text{D}_3^+$	$(\text{CD}_3)_2\text{CH}_3\text{CH}$	XXXXX-XX-X	CD_3	11.16 ± 0.02	PI	5025
C_3HD_6^+	$(\text{CD}_3)_2\text{CH}_3\text{CH}$	XXXXX-XX-X	CH_3	11.16 ± 0.02	PI	5025
C_3H_8^+	C_3H_8	74-98-6	**	11.5 (V)	PE	3710
			**	11.5 (V)	PE	5084
			**	11.01 ± 0.07	EI	5503
			**	11.27 ± 0.05	EI	3791
$\text{C}_3\text{H}_2\text{D}_6^+$	$\text{CD}_3\text{CH}_2\text{CD}_3$	2875-96-9	**	10.94	PI	5615
C_7H_2^+	$\text{HC} \equiv \text{CC} \equiv \text{CH}$	460-12-8	**	10.17	PE	4048
			**	10.17	PE	5313
			**	10.30 (V)	PE	5084
			**	10.08 ± 0.1	EI	4714
	$\text{CH}_3\text{C} \equiv \text{CC} \equiv \text{CCH}_3$	2809-69-0	C_2H_4	14.60 ± 0.1	PI	5370

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_4H_3^+$	C_4H_3	XXXXXX-XX-X	**	8.31 ± 0.1	EI	4714
	$CH_3C \equiv CC \equiv CCH_3$	2809-69-0	C_2H_3	14.05 ± 0.1	PI	5370
	C_6H_6 (Benzene)	71-43-2	$H + C_2H_2$	18.48 ± 0.07	EI	4534
	$(CH_3)_2NCH = CHC \equiv CH$	2206-24-8		14.4	EI	3674
	$C_4H_8NCH = CHC \equiv CH$ (Pyrrolidine, 1-(1-buten-3-ynyl)-)	19352-85-3		15.2	EI	3674
	$(C_2H_5)_2NCH = CHC \equiv CH$	1809-53-6		15.0	EI	3674
$C_4H_4^+$	$H_2C = C = C = CH_2$	2873-50-9	**	9.25 ± 0.05	EI	5454
			**	9.15	PE	5034
	$CH_2 = CHC \equiv CH$	689-97-4	**	9.58 ± 0.02	PE	4374
			**	9.63	PE	3997
			**	9.64 ± 0.03 (V)	PE	4538
			**	9.58 ± 0.02	EI	5454
			**	9.9	EI	3767
	$HC \equiv CCH_2CH_2C \equiv CH$	628-16-0	C_2H_2	10.42 ± 0.08	PI	5454
			C_2H_2	10.47 ± 0.1	EI	5454
	$H_3CC \equiv CC \equiv CCH_3$	2809-69-0	C_2H_2	11.27 ± 0.2	PI	5454
	C_6H_6 (Benzene)	71-43-2	C_2H_2	13.85	PI	4075
			C_2H_2	14.17 ± 0.08	PI	5454
			C_2H_2	14.85	PE	4630
			C_2H_2	13.94 ± 0.1	EI	5454
			C_2H_2	14.1	EI	3488
	C_5H_5N (Pyridine)	110-86-1	HCN	11.8-12.0	PI	5028
			HCN	12.34 ± 0.1	EI	5454
			HCN	13.41 ± 0.05	EI	5413
	$(CH_3)_2NCH = CHC \equiv CH$	2206-24-8	$CH_2 = NH + CH_3$	13.4	EI	3674
	$C_4H_8NCH = CHC \equiv CH$ (Pyrrolidine, 1-(1-buten-3-ynyl)-)	19352-85-3		13.7	EI	3674
$C_4D_4^+$	$(CD_2 = C)_2$	25294-38-6	**	9.20	PE	5034
$C_4H_5^+$	C_5H_8 (Cyclopentene)	142-29-0	CH_3	11.83	EI	4203
	C_5H_8 (Spiropentane)	157-40-4	CH_3	10.20	EI	4203
	$C_5H_8 = CH_2$ (Cyclopentane, methylene-)	1528-30-9	C_2H_5	9.7	EI	5586
$C_4H_6^+$	$trans-(CH_2 = CH)_2$	106-99-0	**	9.03	PE	5084
			**	9.0691	S	5199
			**	9.03 (V)	PE	4688
			**	9.18 ± 0.04	EI	4274
	$C_2H_5C \equiv CH$	107-00-6	**	10.178 ± 0.005	PE	4575
	$CH_3C \equiv CCH_3$	503-17-3	**	9.562 ± 0.005	PE	4575
			**	9.59	PE	4048
			**	9.61	PE	4160
			**	9.79 (V)	PE	5084
	$CH_2 = C = CHCH_3$	590-19-2	**	9.33 (V)	PE	4019
			**	9.0 (V)	PE	4225
			**	9.03	PE	3847
	C_4H_6 (Bicyclo[1.1.0]butane)	157-33-5	**	19.1 ± 0.1 (V)	PE	4702
	C_4H_6 (Cyclobutene)	822-35-5	**	9.43 ± 0.03 (V)	PE	4828

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_4H_6^+$	C_4H_6	822-35-5	**	9.43 (V)	PE	4267
	$C_3H_4(=CH_2)$ (Cyclopropane, methylene-)	6142-73-0	**	9.59 (V)	PE	4669
	$iso-C_4H_8$	115-11-7	H_2	11.3 ± 0.1	EI	5268
	C_4H_8 (Cyclobutane)	287-23-0	H_2	11.2 ± 0.1	EI	5268
	$CH \equiv C(CH_2)_3CH_3$	693-02-7	C_2H_4	11.08 ± 0.05	EI	3585
	$CH_3C \equiv CCH_2CH_2CH_3$	764-35-2	C_2H_4	11.02 ± 0.05	EI	3585
	C_6H_{10} (Cyclohexene)	110-83-8	C_2H_4	11.91 ± 0.05	EI	3585
	$C_5H_8=CH_2$ (Cyclopentane, methylene-)	1528-30-9	C_2H_4	10.2	EI	5586
	$C_5H_7CH_3$ (Cyclopentene, 1-methyl-)	693-89-0	C_2H_4	12.32 ± 0.05	EI	3585
	$C_6H_{10}=CH_2$ (Cyclohexane, methylene-)	1192-37-6	C_3H_6	13.2	EI	5586
	$C_6H_{11}Cl$ (Cyclohexane, chloro-)	542-18-7		11.07 ± 0.03	PI	4078
$C_4H_2D_4^+$	<i>trans</i> -($CD_2=CH$) ₂	10545-58-1	**	9.0695	S	5199
$C_4D_6^+$	<i>trans</i> -($CD_2=CD$) ₂	1441-56-1	**	9.0698	S	5199
$C_4H_7^+$	$(CH_3)_2C=CHCH_2$	513-35-9	CH_3	11.33 ± 0.12	EI	3544
	$(CH_3)_2CHCH=CH_2$	563-45-1	CH_3	11.15 ± 0.12	EI	3544
	$C_2H_5C(CH_3)=CH_2$	563-46-2	CH_3	11.34 ± 0.07	EI	3544
	$1-C_5H_{10}$	109-67-1	CH_3	11.35 ± 0.07	EI	3544
	<i>cis</i> -2- C_5H_{10}	627-20-3	CH_3	11.24 ± 0.02	EI	3544
	<i>trans</i> -2- C_5H_{10}	646-04-8	CH_3	11.35 ± 0.03	EI	3544
	C_5H_{10} (Cyclopentane)	287-92-3	CH_3	11.36 ± 0.08	EI	3544
	C_6H_{12} (Cyclohexane)	110-82-7	C_2H_5	11.21 ± 0.04	PI	4078
	$C_6H_{10}=CH_2$ (Cyclohexane, methylene-)	1192-37-6	C_3H_5	13.7	EI	5586
	$C_6H_{11}Cl$ (Cyclohexane, chloro-)	542-18-7		11.52 ± 0.05	PI	4078
	$CH_2=CHCH_2CH_2Br$	5162-44-7	Br	10.6	EI	5633
	$C_6H_{11}Br$ (Cyclohexane, bromo-)	108-85-0		11.54 ± 0.02	PI	4078
$C_4H_8^+$	$1-C_4H_8$	106-98-9	**	9.59 ± 0.02	PI	5018
			**	9.625 ± 0.003	PE	3957
			**	9.72 (V)	PE	3950
			**	9.77 ± 0.01 (V)	PE	4939
			**	10.0 (V)	PE	4225
	$2-C_4H_8$	107-01-7	**	9.13 (V)	PE	5600
			**	9.21	PE	3533
			**	9.239 ± 0.003	PE	3957
			**	9.39 (V)	PE	4614
			**	9.41 (V)	PE	4669
	<i>iso</i> - C_4H_8	115-11-7	**	9.45 (V)	PE	4513
			**	9.11 ± 0.03 (V)	PE	4828
			**	9.11 ± 0.02	PI	5018
			**	9.07	PE	3533
			**			
	<i>cis</i> -2- C_4H_8	590-18-1	**			
			**			
			**			

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_4H_8^+$	<i>cis</i> -2- C_4H_8	590-18-1	**	9.124±0.005	PE	3957
			**	9.20 (V)	PE	4669
			**	9.29 (V)	PE	4084
			**	9.32±0.01 (V)	PE	4939
			**	9.36 (V)	PE	4513
			**	9.4 (V)	PE	4225
	<i>trans</i> - $CH_3CH=CHCH_3$	624-64-6	**	9.11 (V)	PE	3649
			**	9.10±0.02	PI	5018
			**	9.09	PE	3533
			**	9.11	PE	4267
			**	9.122±0.005	PE	3957
			**	9.32 (V)	PE	4084
			**	9.37 (V)	PE	4513
			**	9.5 (V)	PE	4225
	C_4H_8 (Cyclobutane)	287-23-0	**	9.92±0.05	PE	3757
			**	10.7±0.1 (V)	PE	4037
	C_4H_8 (Cyclopropane, methyl-)	594-11-6	**	9.9±0.2	EI	3493
	<i>n</i> - C_5H_{12}	109-66-0	CH_4	11.00	EI	5284
	C_6H_{12} (Cyclohexane)	110-82-7	C_2H_4	11.08±0.01	PI	4078
			C_2H_4	11.45	EI	4319
	$(CH_3)_2CHC_2H_4CHO$	1119-16-0	C_2H_4O	11.10	EI	5264
	$C_2H_5CH(CH_3)CH_2CHO$	15877-57-3	CH_3CHO	9.86	EI	4729
			C_2H_4O	11.10	EI	5264
	<i>n</i> - $C_5H_{11}CHO$	66-25-1	C_2H_4O	10.70	EI	5264
	<i>n</i> - $C_6H_{13}OH$	111-27-3		9.89	EI	4729
	$C_6H_{11}Cl$ (Cyclohexane, chloro-)	542-18-7		10.2±0.01	PI	4078
$C_4H_9^+$	<i>tert</i> - C_4H_9	1605-73-8	**	6.58±0.01	PE	4634
			**	6.70±0.03	PE	4899
			**	6.95±0.05 (V)	PE	4614
	<i>iso</i> - C_4H_{10}	75-28-5	H	10.68±0.02	PI	5025
			H	10.68±0.03	PI	5345
	<i>neo</i> - C_5H_{12}	463-82-1	CH_3	10.35	PI	5482
	$(tert-C_4H_9)_3Li_4$	25395-78-2		11.±0.50	PI	5455
	<i>tert</i> - C_4H_9NO	917-95-3		8.9±0.1	EI	3654
	$C_6H_5S(tert-C_4H_9)$ (Benzene, [(1,1-dimethylethyl)thio]-)	3019-19-0		10.47±0.1	EI	4198
	<i>tert</i> - C_4H_9Cl	507-20-0	Cl	10.51±0.01	PI	5345
	$C_6H_{11}Cl$ (Cyclohexane, chloro-)	542-18-7		10.56±0.02	PI	4078
	<i>tert</i> - $C_4H_9SiCl_3$	18171-74-9	$SiCl_3$	10.7±0.1	EI	5276
	$(CH_3)_3CGe(CH_3)_3$	1184-91-4	$(CH_3)_3Ge$	10.19±0.27	EI	3548
	<i>tert</i> - C_4H_9Br	507-19-7	Br	9.85±0.01	PI	5345
	$(tert-C_4H_9)(CH_3)_3Sn$	3531-47-3	$(CH_3)_3Sn$	10.03±0.23	EI	3548
	<i>tert</i> - C_4H_9I	558-17-8	I	8.98±0.01	PI	5345
	$(tert-C_4H_9)(CH_3)_3Pb$	32997-03-8	$(CH_3)_3Pb$	9.45±0.15	EI	3548
$C_4H_{10}^+$	<i>n</i> - C_4H_{10}	106-97-8	**	10.6±0.1	PE	4702
			**	11.2 (V)	PE	5084
			**	10.87±0.05	EI	3791
			**	10.89	EI	3538
	<i>iso</i> - C_4H_{10}	75-28-5	**	11.4 (V)	PE	3710
			**	10.74±0.05	EI	3791

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_5H_2^+$	$CH \equiv CC \equiv CCH_3$	4911-55-1	H_2	13.7	EI	5404
$C_5H_3^+$	$CH \equiv CC \equiv CCH_3$	4911-55-1	H	11.6 ± 0.2	EI	5404
$C_5H_1^+$	$CH_3C \equiv CC \equiv CH$	4911-55-1	**	9.51	PE	4048
			**	9.51	PE	5404
	1,2,3,4- C_5H_4	21986-03-8	**	8.67	PE	4686
$C_5H_5^+$	C_5H_5 (Cyclopentadienyl)	XXXXX-XX-X	**	8.41	EI	4545
	$C_6H_5CH_3$ (Benzene, methyl-)	108-88-3	$C_2H_2 + H$	16.4 ± 0.2	EI	4331
	$C_6H_4(CH_3)_2$ (Benzene, 1,4-dimethyl-)	106-42-3	$C_2H_2 + CH_3$	16.3 ± 0.2	EI	4331
	$C_6H_5C_2H_5$ (Benzene, ethyl-)	100-41-4	$C_2H_2 + CH_3$	16.2 ± 0.2	EI	4331
	$C_6H_5C_3H_7$ (Benzene, propyl-)	103-65-1	$C_2H_5 + C_2H_2$	15.5 ± 0.2	EI	4331
	$C_6H_5NH_2$ (Benzenamine)	62-53-3	$HCN + H$	15.2 ± 0.2	EI	4331
	C_6H_5OH (Phenol)	108-95-2	$CO + H$	14.2 ± 0.2	EI	4331
	$C_6H_4(NO_2)CH_3$ (Benzene, 1-methyl-2-nitro-)	88-72-2	$HCN + CO + OH$	13.5 ± 0.2	EI	4331
	$C_6H_4(NO_2)CH_3$ (Benzene, 1-methyl-3-nitro-)	99-08-1	$C_2H_2 + NO_2$	14.8	EI	4331
	$C_6H_4(NO_2)CH_3$ (Benzene, 1-methyl-4-nitro-)	99-99-0	$C_2H_2 + NO_2$	15.2 ± 0.2	EI	4331
	$C_6H_4ClCH_3$ (Benzene, 1-chloro-2-methyl-)	95-49-8		15.67 ± 0.015	EI	3777
	$C_6H_4ClCH_3$ (Benzene, 1-chloro-3-methyl-)	108-41-8	$C_2H_2 + Cl$	15.7 ± 0.2	EI	4331
			$C_2H_2 + Cl$	15.7 ± 0.2	EI	4331
	$C_6H_4ClCH_3$ (Benzene, 1-chloro-4-methyl-)	106-43-4		15.71 ± 0.15	EI	3777
				15.66 ± 0.15	EI	3777
	$C_6H_4BrCH_3$ (Benzene, 1-bromo-2-methyl-)	95-46-5	$C_2H_2 + Cl$	15.7 ± 0.2	EI	4331
				15.19 ± 0.15	EI	3777
	$C_6H_4BrCH_3$ (Benzene, 1-bromo-3-methyl-)	591-17-3	$C_2H_2 + Br$	15.2 ± 0.2	EI	4331
			$C_2H_2 + Br$	15.2 ± 0.2	EI	4331
	$C_6H_4BrCH_3$ (Benzene, 1-bromo-4-methyl-)	106-38-7	$C_2H_2 + Br$	15.20 ± 0.15	EI	3777
				15.2 ± 0.2	EI	4331
	$C_6H_4ICH_3$ (Benzene, 1-iodo-2-methyl-)	615-37-2	$C_2H_2 + I$	15.23 ± 0.15	EI	3777
				14.3 ± 0.2	EI	4331
	$C_6H_4ICH_3$ (Benzene, 1-iodo-3-methyl-)	625-95-6		14.34 ± 0.15	EI	3777
				14.47 ± 0.15	EI	3777
	$C_6H_4ICH_3$ (Benzene, 1-iodo-4-methyl-)	624-31-7	$C_2H_2 + I$	14.5 ± 0.2	EI	4331
				14.66 ± 0.15	EI	3777
			$C_2H_2 + I$	14.7 ± 0.2	EI	4331

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_5H_6^+$	$CH_2=C(CH_3)C\equiv CH$	78-80-8	**	9.23 ± 0.01	PE	5407
			**	9.30 ± 0.03 (V)	PE	4538
			**	10.1	EI	3767
	$CH_2=CHC\equiv CCH_3$	646-05-9	**	9.00 ± 0.01	PE	5407
			**	9.06 ± 0.03 (V)	PE	4538
			**	9.4	EI	3767
	$CH_3CH=CHC\equiv CH$	2206-23-7	**	8.5	EI	3767
	$CH_2=C=CHCH=CH_2$	10563-01-6	**	8.88 (V)	PE	4397
	<i>cis</i> - $CH_3CH=CHC\equiv CH$	1574-40-9	**	9.17 ± 0.03 (V)	PE	4538
			**	9.11 ± 0.01	OTH	5407
	<i>trans</i> - $CH_3CH=CHC\equiv CH$	2004-69-5	**	9.11 ± 0.03 (V)	PE	4538
			**	9.05 ± 0.01	OTH	5407
	C_5H_6 (Bicyclo[2.1.0]pent-2-ene)	5164-35-2	**	8.6 (V)	PE	5621
	C_5H_6 (Cyclopentadiene)	26912-33-4	**	8.56 ± 0.01	EI	3535
	C_5H_6 (1,3-Cyclopentadiene)	542-92-7	**	8.56 (V)	PE	4179
			**	8.6 (V)	PE	4373
			**	8.61 (V)	PE	5535
			**	9.0	EI	3476
	$C_3H_3C\equiv CH$ (Cyclopropane, ethynyl-)	6746-94-7	**	9.58 (V)	PE	3997
	C_7H_{10} (Bicyclo[2.2.1]hept-2-ene)	498-66-8	C_2H_4	9.22 ± 0.01	EI	3535
	C_7H_{10} (Tricyclo[2.2.1.0 ^{2,6}]heptane)	279-19-6	C_2H_4	9.44 ± 0.01	EI	3535
	$C_6H_7NH_2$ (Benzenamine)	62-53-3		$12.04 \pm <0.1$	EI	3735
			HCN	12.13 ± 0.06	EI	3784
			HCN	12.77 ± 0.05	EI	5413
	C_6H_7OH (Phenol)	108-95-2	CO	12.45 ± 0.1	EI	3817
	C_6H_7SH (Benzenethiol)	108-98-5	CS	12.18 ± 0.1	EI	3817
	C_7H_9Br (Bicyclo[2.2.1]hept-2-ene, 5-bromo-, <i>endo</i> -)	5810-82-2	C_2H_3Br	10.0	EI	5633
	C_7H_9Br (Bicyclo[2.2.1]hept-2-ene, 5-bromo-, <i>exo</i> -)	5889-54-3	C_2H_3Br	10.0	EI	5633
$C_5H_7^+$	$CH_2=CHCHCH=CH_2$	XXXXX-XX-X	**	7.25	EI	4591
	$CH\equiv CC(CH_3)_2$	XXXXX-XX-X	**	7.44	EI	4591
	$CH\equiv CCHCH_2CH_3$	XXXXX-XX-X	**	7.6	OTH	4591
	$CH_2=CHC(=CH_2)CH_2$	XXXXX-XX-X	**	7.9	OTH	4591
	C_5H_7 (Cyclopentenyl)	XXXXX-XX-X	**	7.00	EI	4545
	C_5H_7 (Cyclopentenyl)	XXXXX-XX-X	**	7.00	EI	4591
	$CH_2=C(CH_3)CH=CH_2$	78-79-5	H	8.85	EI	4591
			H	10.54	EI	4203
	$CH_2=CHCH=CHCH_3$	504-60-9	H	10.52	EI	4203
	$CH_2=CHCH_2CH=CH_2$	591-93-5	H	9.46	EI	4591
			H	10.23	EI	4203
	<i>trans</i> - $CH_2=CHCH=CHCH_3$	2004-70-8	H	8.60	EI	4591
	C_5H_8 (Cyclopentene)	142-29-0	H	9.00	EI	4591
			H	10.98	EI	4203
	C_5H_8 (Spiropentane)	157-40-4	H	9.26	EI	4591

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_5H_7^+$	C_5H_8	157-40-4	H	9.53 ± 0.03	EI	4203
	C_5H_7D (Cyclopentene-1- <i>d</i>)	37729-44-5	D	11.03 ± 0.03	EI	4203
	C_6H_{10}	XXXXXX-XX-X	CH_3	8.45	EI	4591
	$CH_2=C(C_2H_5)CH=CH_2$	XXXXXX-XX-X	CH_3	8.81	EI	4591
	C_6H_{10}	XXXXXX-XX-X	CH_3	10.06 ± 0.05	EI	5483
	$CH_2=C(C_2H_5)CH=CH_2$	XXXXXX-XX-X	CH_3	10.08 ± 0.05	EI	5483
	$CH_2=(C(CH_3))_2=CH_2$	513-81-5	CH_3	8.66	EI	4591
	$CH_2=CH(CH_2)_2CH=CH_2$	592-42-7	CH_3	10.22 ± 0.05	EI	5483
			CH_3	9.29	EI	4591
	$CH \equiv C(CH_2)_3CH_3$	693-02-7	CH_3	9.35 ± 0.05	EI	5483
			CH_3	10.04 ± 0.05	EI	5483
	$CH_2=C(CH_3)CH_2CH=CH_2$	763-30-4	CH_3	10.87 ± 0.05	EI	3585
			CH_3	9.16	EI	4591
	$CH_3C \equiv CCH_2CH_2CH_3$	764-35-2	CH_3	9.40 ± 0.05	EI	5483
			CH_3	$\leq 9.93 \pm 0.05$	EI	5483
	$CH \equiv CC(CH_3)_3$	917-92-0	CH_3	10.63 ± 0.05	EI	3585
			CH_3	9.90 ± 0.05	EI	5483
	$CH \equiv CCH(CH_3)C_2H_5$	922-59-8	CH_3	10.76 ± 0.06	EI	4126
			CH_3	9.93 ± 0.05	EI	5483
	C_6H_{10}	926-54-5	CH_3	10.23 ± 0.05	EI	5483
	$CH_2=CHCH=C(CH_3)_2$	926-56-7	CH_3	10.18 ± 0.05	EI	5483
	$C_2H_5C \equiv CC_2H_5$	928-49-4	CH_3	9.88 ± 0.05	EI	5483
	$CH_2=CHCH(CH_3)CH=CH_2$	1115-08-8	CH_3	9.54 ± 0.05	EI	5483
	C_6H_{10}	2787-45-3	CH_3	10.16 ± 0.05	EI	5483
	$(CH_3)_2C=C=CHCH_3$	3043-33-2	CH_3	9.55 ± 0.05	EI	5483
	C_6H_{10}	5194-51-4	CH_3	10.14 ± 0.05	EI	5483
	$CH \equiv CCH_2CH(CH_3)_2$	7154-75-8	CH_3	10.03 ± 0.05	EI	5483
	$CH_2=C=C(CH_3)C_2H_5$	7417-48-3	CH_3	9.44 ± 0.05	EI	5483
	$CH_2=C=CHCH(CH_3)_2$	13643-05-5	CH_3	9.78 ± 0.05	EI	5483
	$CH_3C \equiv CCH(CH_3)_2$	21020-27-9	CH_3	9.67 ± 0.05	EI	5483
	$1,2\text{-}n\text{-}C_6H_{10}$	592-44-9	CH_3	9.12 ± 0.05	EI	5483
	$2,3\text{-}n\text{-}C_6H_{10}$	592-49-4	CH_3	9.38 ± 0.05	EI	5483
	$cis\text{-}CH_2=CHCH=CHC_2H_5$	XXXXXX-XX-X	CH_3	8.54	EI	4591
	$cis\text{-}1,4\text{-}n\text{-}C_6H_{10}$	7318-67-4	CH_3	9.61 ± 0.05	EI	5483
	$trans\text{-}1,4\text{-}n\text{-}C_6H_{10}$	7319-00-8	CH_3	9.60 ± 0.05	EI	5483
	$trans\text{-}1,3\text{-}n\text{-}C_6H_{10}$	20237-34-7	CH_3	9.74 ± 0.05	EI	5483
	$trans,cis\text{-}2,4\text{-}n\text{-}C_6H_{10}$	5194-50-3	CH_3	10.10 ± 0.05	EI	5483
	$(C_3H_5)_2$ (1,1'-Bicyclopropyl)	5685-46-1	CH_3	9.34 ± 0.05	EI	5483
	$C_4H_6(=CHCH_3)$ (Cyclobutane, ethenyl-)	2597-49-1	CH_3	9.88 ± 0.05	EI	5483
	C_6H_{10} (Cyclohexene)	110-83-8	CH_3	8.95	EI	4591
	$C_5H_8=CH_2$ (Cyclopentane, methylene-)	1528-30-9	CH_3	11.22 ± 0.05	EI	3585
			CH_3	8.2	EI	5586
	$C_5H_7CH_3$ (Cyclopentene, 1-methyl-)	693-89-0	CH_3	11.71 ± 0.05	EI	3585
			CH_3	8.59	EI	4591
	$C_5H_7CH_3$ (Cyclopentene, 3-methyl-)	1120-62-3	CH_3	11.59 ± 0.05	EI	3585
			CH_3	8.95	EI	4591
	$C_3H_5C(CH_3)=CH_2$ (Cyclopropane, (1-methylethenyl)-)	4663-22-3	CH_3	9.18 ± 0.05	EI	5483
	$C_4H(CH_3)_3$ (Cyclopropene, 1,3,3-trimethyl-)	3664-56-0	CH_3	8.78 ± 0.05	EI	5483
	$C_6H_{10}=CH_2$ (Cyclohexane, methylene-)	1192-37-6	C_2H_5	12.5	EI	5586
	$C_{10}H_{16}$ (4,7-Methano-1 <i>H</i> -indene, octahydro-, (3 α ,4 β ,7 β ,7 α)-)	2825-82-3		10.0 ± 0.1	PI	3918

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_5H_7^+$	$C_{10}H_{15}CH_3$	XXXXX-XX-X		$\leq 10.2 \pm 0.1$	PI	3918
	$C_{10}H_{15}CH_3$ (4,7-Methano-1 <i>H</i> -indene, octahydro-2-methyl, (2 α ,3 α β ,4 α ,7 α ,7 α β)-)	50745-90-9		$> 10.2 \pm 0.1$	PI	3918
	$C_{10}H_{15}CH_3$ (4,7-Methano-1 <i>H</i> -indene, octahydro-8-methyl-, stereoisomer)	50745-92-1		$> 10.5 \pm 0.1$	PI	3918
	$C_{10}H_{15}C_2H_5$ (4,7-Methano-1 <i>H</i> -indene, 5-ethyloctahydro-, (3 α ,4 β ,5 α ,7 β ,7 α)-)	32787-97-6		$> 10.2 \pm 0.1$	PI	3918
	$C_5H_7N(CH_3)$ (Pyridine,2-methyl-)	109-06-8	HCN	12.87 ± 0.05	EI	5413
	$C_5H_7N(CH_3)$ (Pyridine,3-methyl-)	108-99-6	HCN	12.94 ± 0.05	EI	5413
	$C_5H_7N(CH_3)$ (Pyridine,4-methyl-)	108-89-4	HCN	12.86 ± 0.05	EI	5413
	$C_6H_{11}Cl$ (Cyclohexane, chloro-)	542-18-7		10.67 ± 0.05	PI	4078
$C_5H_6D^+$	C_5H_7D (Cyclopentene-1- <i>d</i>)	37729-44-5	H	10.98 ± 0.03	EI	4203
$C_5H_4D_3^+$	$C_5H_4D_4$ (Spiropentane-1,1,2,2- <i>d</i> ₄)	14996-50-0	D	9.72 ± 0.03	EI	4203
$C_5H_3D_4^+$	$C_5H_4D_4$ (Spiropentane-1,1,2,2- <i>d</i> ₄)	14996-50-0	H	9.55 ± 0.03	EI	4203
$C_5H_8^+$	$CH_2=C=CHCHCH_3$	591-95-7	**	9.25	PE	5411
			**	9.22 (V)	PE	4748
	$CH_2=C(CH_3)CH=CH_2$	78-79-5	**	8.87 (V)	PE	5010
			**	8.89	PE	3847
			**	9.04 (V)	PE	3892
	$CH_2=CHCH=CHCH_3$	504-60-9	**	8.67	PE	5411
			**	8.6	EI	5200
	$(CH_2=CH)_2CH_2$	591-93-5	**	7.97 (V)	PE	5314
			**	9.62 ± 0.02	PE	4010
			**	9.72 (V)	PE	4211
	$CH_3CH=C=CHCH_3$	591-96-8	**	9.13 (V)	PE	4019
	$(CH_3)_3CHC\equiv CH$	598-23-2	**	10.049 ± 0.007	PE	4575
	$(CH_3)_3C=C=CH_2$	598-25-4	**	8.95 (V)	PE	4019
			**	8.9	EI	5200
	$C_7H_7C\equiv CH$	627-19-0	**	10.098 ± 0.005	PE	4575
	$C_5H_5C\equiv CCH_3$	627-21-4	**	9.439 ± 0.005	PE	4575
			**	9.25 ± 0.02	PE	4702
	1,3- <i>trans</i> - C_5H_8	2004-70-8	**	8.67 ± 0.02	PE	4702
			**	8.61	PE	3847
	<i>cis</i> - $CH_3CH=CHCH=CH_2$	1574-41-0	**	8.64	PE	5202
			**	8.60 (V)	PE	5005
			**	8.60 (V)	PE	5010
	C_5H_8	185-94-4	**	8.7 ± 0.1	PE	4702
	(Bicyclo[2.1.0]pentane) (JC-Mean value of Jahn-Teller components)					
	$C_7H_8(=CH_2)$ (Cyclobutane, methylene-)	1120-56-5	**	9.35 (V)	PE	4669
	C_5H_8	142-29-0	**	9.02 ± 0.01	PI	5556
	(Cyclopentene)					
			**	9.01 ± 0.03 (V)	PE	4828
			**	9.12 (V)	PE	4285
			**	9.17 (V)	PE	4517

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.	
C ₅ H ₈ ⁺	C ₅ H ₈	142-29-0	**	9.18 (V)	PE	4267	
			**	9.20 (V)	PE	4189	
			**	9.20 (V)	PE	4669	
			**	9.00	EI	4203	
			**	9.1	EI	5200	
	C ₃ H ₅ CH=CH ₂ (Cyclopropane, ethenyl-)	693-86-7	**	8.7	PE	4329	
			**	9.1 (V)	PE	4034	
			**	9.15 (V)	PE	4347	
	C ₅ H ₈ (Spiropentane)	157-40-4	**	9.2	PE	3576	
			**	9.26	EI	4203	
			C ₅ H ₈ =CH ₂ (Cyclopentane,methylene-)	1528-30-9	CH ₂	9.2	EI
	C ₆ H ₁₀ =CH ₂ (Cyclohexane,methylene-)	1192-37-6	C ₂ H ₄	12.2	EI	5586	
	C(CH ₃)(CH ₂)C ₆ H ₈ CH ₃ (Cyclohexene, 1-methyl-4-(1-methylethenyl)-)	138-86-3	C ₅ H ₈	11.6	EI	5200	
	n-C ₄ H ₉ CHO	110-62-3	H ₂ O	9.80±0.06	EI	5267	
			H ₂ O	10.00	EI	5264	
	C ₅ H ₉ OH (Cyclopentanol)	96-41-3	H ₂ O	9.66±0.06	EI	5267	
	C ₅ H ₉ ⁺	CH ₃ CH=CHCHCH ₃	XXXXXX-XX-X	**	7.07	EI	4591
		CH ₂ =C(CH ₃)CHCH ₃	XXXXXX-XX-X	**	7.4	OTH	4591
		CH ₂ =C(C ₂ H ₅)CH ₂	XXXXXX-XX-X	**	7.9	OTH	4591
CH ₂ CH(CH ₃)CH=CH ₂		XXXXXX-XX-X	**	8.0	OTH	4591	
CH ₂ =CHCHC ₂ H ₅		17829-37-7	**	7.30	EI	4591	
CH ₂ =CHC(CH ₃) ₂		29791-12-6	**	7.13	EI	4591	
C ₅ H ₉ (Cyclopentyl)		3889-74-5	**	7.47	EI	4545	
			**	7.47	EI	4591	
((CH ₃) ₂ C) ₂		563-79-1	CH ₃	8.16	EI	4591	
(CH ₃) ₂ C=CHC ₂ H ₅		625-27-4	CH ₃	8.58	EI	4591	
n-C ₄ H ₉ CH=CH ₂		592-41-6	CH ₃	9.44	EI	4591	
n-C ₄ H ₇ C(CH ₃)=CH ₂		763-29-1	CH ₃	9.04	EI	4591	
sec-C ₄ H ₉ CH=CH ₂		760-20-3	CH ₃	9.44	EI	4591	
iso-C ₄ H ₉ CH=CH ₂		691-37-2	CH ₃	9.44	EI	4591	
iso-C ₄ H ₇ C(CH ₃)=CH ₂		27416-06-4	CH ₃	9.01	EI	4591	
tert-C ₄ H ₉ CH=CH ₂		558-37-2	CH ₃	9.44	EI	4591	
cis-CH ₃ CH=C(CH ₃)C ₂ H ₅		922-62-3	CH ₃	8.58	EI	4591	
trans-(CH ₃) ₂ CHCH=CHCH ₃		674-76-0	CH ₃	8.91	EI	4591	
trans-CH ₃ CH=CHC ₃ H ₇		4050-45-7	CH ₃	8.93	EI	4591	
trans-C ₂ H ₅ CH=CHC ₂ H ₅		13269-52-8	CH ₃	8.97	EI	4591	
C ₆ H ₁₂ (Cyclohexane)		110-82-7	CH ₃	11.07±0.04	PI	4078	
			CH ₃	9.88	EI	4591	
			CH ₃	11.15	EI	4319	
C ₅ H ₉ CH ₃ (Cyclopentane, methyl-)		96-37-7	CH ₃	10.42	EI	4591	
C ₂ H ₅ CH(C ₂ H ₅)=CH ₂		760-21-4	CH ₃	9.01	EI	4591	
C ₁₀ H ₁₆ (4,7-Methano-1H-indene, octahydro-, (3α,4β,7β,7α)-)		2825-82-3		10.5±0.1	PI	3918	
C ₆ H ₉ Cl (Cyclohexane, chloro-)		542-18-7		11.01±0.02	PI	4078	
CH ₂ =CH(CH ₂) ₃ Br		1119-51-3	Br	10.2	EI	5633	
C ₅ H ₁₀ ⁺		(CH ₃) ₂ C=CHCH ₂	513-35-9	**	8.83±0.11	EI	3544
				**	8.682±0.003	PE	3957

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_3H_{10}^+$	$(CH_3)_2C=CHCH_2$	513-35-9	**	8.72	PE	3533
	$(CH_3)_2CHCH=CH_2$	563-45-1	**	9.533 ± 0.003	PE	3957
			**	9.60 ± 0.03	EI	3544
	$C_2H_5C(CH_3)=CH_2$	563-46-2	**	9.148 ± 0.003	PE	3957
			**	9.35 ± 0.08	EI	3544
	1- C_5H_{10}	109-67-1	**	9.42 ± 0.02	PE	4695
			**	9.524 ± 0.003	PE	3957
			**	9.54 ± 0.02 (V)	PE	4010
			**	9.68 ± 0.01 (V)	PE	4939
			**	9.82 ± 0.06	EI	3544
	2- <i>cis</i> - C_5H_{10}	627-20-3	**	8.94 ± 0.02	PE	4695
			**	9.22 ± 0.01 (V)	PE	4939
			**	9.036 ± 0.005	PE	3957
			**	9.23 ± 0.02	EI	3544
	<i>trans</i> -2- C_5H_{10}	646-04-8	**	9.036 ± 0.005	PE	3957
			**	9.23 ± 0.01 (V)	PE	4939
			**	9.32 ± 0.03	EI	3544
			**	9.60	PE	4268
	$C_4H_7CH_3$ (Cyclobutane, methyl-)	598-61-8	**			
			**			
	C_5H_{10} (Cyclopentane)	287-92-3	**	10.55 ± 0.03	PI	5556
			**	10.3 ± 0.1	PE	4702
			**	10.40	PE	4056
			**	10.48	PE	4319
			**	10.5 (V)	PE	4189
			**	10.54 ± 0.05	EI	4319
			**	10.91 ± 0.07	EI	3544
$C_3H_{11}^+$	1- C_5H_{11}	2672-01-7	**	7.94 ± 0.06	EI	4895
	2- C_5H_{11}	2492-34-4	**	7.41	EI	4895
	<i>tert</i> - $C_4H_9CH_2$	3744-21-6	**	7.91	EI	4895
	<i>tert</i> - C_5H_{11}	4348-35-0	**	6.85	EI	4895
	<i>tert</i> - $C_5H_{11}NO$	34946-78-6		8.7 ± 0.1	EI	3654
	<i>(iso-C_5H_{11})SOCH_3</i>	55860-10-1	CH_3SO	9.1 ± 0.3	EI	5311
$C_3H_{12}^+$	<i>n</i> - C_5H_{12}	109-66-0	**	10.2 ± 0.1	PE	4702
			**	10.36	PE	4056
			**	10.59 ± 0.05	EI	3791
	<i>iso</i> - C_5H_{12}	78-78-4	**	10.3 ± 0.1	PE	4702
			**	10.50 ± 0.05	EI	3791
	<i>neo</i> - C_5H_{12}	463-82-1	**	10.21 ± 0.04	PE	3880
			**	10.25 ± 0.1	PE	3677
			**	11.3 (V)	PE	3710
			**	11.3 (V)	PE	4050
$C_6H_2^+$	$HC \equiv CC \equiv CC \equiv CH$	3161-99-7	**	9.50	PE	4048
			**	9.63 (V)	PE	5084
$C_6H_4^+$	<i>cis</i> - $CH=CCH=CHC \equiv CH$	16668-67-0	**	9.10 ± 0.02	PE	4374
	<i>trans</i> - $CH=CCH=CHC \equiv CH$	16668-68-1	**	9.07 ± 0.02	PE	4374
	C_6H_4	462-80-6	**	9.75 ± 0.2	EI	3583
	(1,3-Cyclohexadien-5-yne)					
	C_6H_6	71-43-2	H_2	12.94	PI	4075
	(Benzene)					
			H_2	14.04 ± 0.06	EI	3784
				14.14 ± 0.08	EI	4534
	C_6H_5CN	100-47-0	HCN	13.38 ± 0.03	EI	5080
	(Benzonitrile)					

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_6H_1^+$	C_6H_5CN	100-47-0	HCN	13.80 ± 0.06	EI	3784
				$13.92 \pm < 0.1$	EI	3735
$C_6H_5^+$	C_6H_5	2396-01-2	**	8.1 ± 0.1	PI	3752
	(Phenyl)					
	$HC \equiv CCH_2CH_2C \equiv CH$	628-16-0	H	10.16 ± 0.08	PI	5454
			H	10.21 ± 0.03	EI	3790
	$H_2CC \equiv CC \equiv CCH_3$	2809-69-0	H	10.55 ± 0.09	PI	5454
	$HC \equiv CCH_2C \equiv CCH_3$	10420-91-4	H	10.21 ± 0.1	EI	5454
	C_6H_6	71-43-2	H	12.94	PI	4075
	(Benzene)					
			H	13.78 ± 0.08	PI	5454
			H	13.74 ± 0.1	EI	5454
			H	13.97 ± 0.06	EI	3784
			H	$14.05 \pm < 0.1$	EI	3735
			H	14.56 ± 0.07	EI	4534
	$C_6H_5CH_3$	108-88-3	CH_3	13.70	EI	4115
	(Benzene, methyl-)					
	C_7H_8	544-25-2	CH_3	14.17	EI	4115
	(1,3,5-Cycloheptatriene)					
	<i>trans</i> - $CH_2=CHCH=CHCH=CHCH_3$	17679-93-5		12.3 ± 0.15	PE	5432
	$C_6H_5CH_2CH_2N(CH_3)_2$	29088-49-1	$C_4H_{10}N$	10.55	PI	5543
	(Benzeneethanamine, dimethyl-)					
	C_6H_5CHO	100-52-7	$CO + H$	14.11	EI	3792
	(Benzaldehyde)					
	$C_6H_5COCH_3$	98-86-2	$CO + CH_3$	13.28	EI	3626
	(Ethanone, 1-phenyl-)					
			$CO + CH_3$	13.97	EI	3792
	$(C_6H_5)_2CO$	119-61-9	$C_6H_5 + CO$	15.67	EI	3792
	(Methanone, diphenyl-)					
	C_6H_5COOH	65-85-0		14.3 ± 0.07	EI	5121
	(Benzoic acid)					
			$CO + OH$	15.08 ± 0.2	EI	3973
			$CO + OH$	15.08	EI	3792
	$C_6H_5COOCH_3$	93-58-3	$CH_3O + CO$	13.82	EI	3626
	(Benzoic acid methyl ester)					
				14.3 ± 0.07	EI	5121
			$CH_3O + CO$	14.74	EI	3792
	$C_6H_5COOC_2H_5$	93-89-0		14.5 ± 0.03	EI	5121
	(Benzoic acid, ethyl ester)					
	$C_6H_5COOC_3H_7$	939-48-0		15.0 ± 0.10	EI	5121
	(Benzoic acid, 1-methylethyl ester)					
	$C_6H_5COOC_3H_7$	2315-68-6		14.9 ± 0.06	EI	5121
	(Benzoic acid, propyl ester)					
	$C_6H_5COOC_4H_9$	136-60-7		15.0 ± 0.03	EI	5121
	(Benzoic acid, butyl ester)					
	$C_6H_5COOC_3H_7$	120-50-3		15.0 ± 0.04	EI	5121
	(Benzoic acid, 2-methylpropyl ester)					
	$C_6H_5COOC_4H_9$	XXXXX-XX-X		15.2 ± 0.10	EI	5121
	(Benzoic acid, methylbutyl ester)					
	C_6H_5NO	586-96-9		11.0 ± 0.1	EI	3654
	(Benzene, nitroso-)					
	$C_6H_5CONH_2$	55-21-0	$NH_2 + CO$	14.21	EI	3792
	(Benzamide)					
	$C_6H_5COC_6H_4NH_2$	2835-77-0		15.6 ± 0.3	EI	4358
	(Methanone, (2-aminophenyl)phenyl-)					
	$C_6H_5COC_6H_4NH_2$	2835-78-1		16.2 ± 0.3	EI	4358
	(Methanone, (3-aminophenyl)phenyl-)					
	$C_6H_5NO_2$	98-95-3	NO_2	9.46 ± 0.05	PI	5437
	(Benzene, nitro-)					

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_6H_5^+$	$C_6H_5NO_2$	98-95-3	NO_2	11.93 ± 0.1	EI	3447
	$C_6H_5COC_6H_4NO_2$ (Methanone, (2-nitrophenyl)phenyl-)	2243-79-0		14.9 ± 0.3	EI	4358
	$C_6H_5COC_6H_4NO_2$ (Methanone, (3-nitrophenyl)phenyl-)	2243-80-3		15.6 ± 0.3	EI	4358
	$C_6H_5COC_6H_4NO_2$ (Methanone, (4-nitrophenyl)phenyl-)	1144-74-7		15.5 ± 0.3	EI	4358
	C_6H_5Cl (Benzene, chloro-)	108-90-7	Cl	12.47 ± 0.06	PI	5181
			Cl	12.81	EI	3626
	C_6H_5COCl (Benzoyl chloride)	98-88-4	Cl + CO	13.81	EI	3792
	$C_6H_5COC_6H_4Cl$ (Methanone, (2-chlorophenyl)phenyl-)	5162-03-8		15.0 ± 0.3	EI	4358
	$C_6H_5COC_6H_4Cl$ (Methanone, (3-chlorophenyl)phenyl-)	1016-78-0		15.2 ± 0.3	EI	4358
	$C_6H_5COC_6H_4Cl$ (Methanone, (4-chlorophenyl)phenyl-)	134-85-0		15.2 ± 0.3	EI	4358
	C_6H_5Br (Benzene, bromo-)	108-86-1	Br	11.82	EI	3626
	C_6H_5I (Benzene, iodo-)	591-50-4	I	11.34	EI	3626
$C_6H_3D_2^+$	$CD \equiv CCH_2CH_2C \equiv CD$	XXXXX-XX-X H		10.18 ± 0.03	EI	3790
$C_6H_6^+$	$HC \equiv CCH_2CH_2C \equiv CH$	628-16-0	**	9.98 ± 0.05	PI	5454
			**	10.48 (V)	PE	4397
			**	9.87 ± 0.03	EI	3790
			**	9.93 ± 0.05	EI	5454
	$CH_2 = CHC \equiv CCH = CH_2$	821-08-9	**	8.50 ± 0.02	PE	4374
	$H_3CC \equiv CC \equiv CCH_3$	2809-69-0	**	8.90 ± 0.05	PI	5454
			**	8.91	PE	4048
			**	8.92	PE	4731
			**	9.08 (V)	PE	5084
			**	9.03 ± 0.1	EI	4714
	$CH_2 = C = (CH)_2 = C = CH_2$	29776-96-3	**	8.53 (V)	PE	4397
	$CH \equiv CCH_2CH = C = CH_2$	33142-15-3	**	9.65 (V)	PE	4397
	C_6H_6 (Benzene)	71-43-2	**	9.2	PI	3586
			**	9.2 (V)	PE	3528
			**	9.22	PE	5408
			**	9.22 (V)	PE	5125
			**	9.23 (V)	PE	4884
			**	9.23 (V)	PE	4472
			**	9.24 ± 0.02 (V)	PE	4913
			**	9.24	PE	4621
			**	9.24	PE	5197
			**	9.24 (V)	PE	3513
			**	9.24 (V)	PE	3673
			**	9.24 (V)	PE	4280
			**	9.24 (V)	PE	4701
			**	9.24 (V)	PE	5012
			**	9.24 (V)	PE	5378
			**	9.24 (V)	PE	5632
			**	9.25 ± 0.03 (V)	PE	3713
			**	9.25 ± 0.05 (V)	PE	4724
			**	9.25	PE	3520
			**	9.25	PE	5084
			**	9.25 (V)	PE	5600

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₆H₆⁺	C ₆ H ₆	71-43-2	**	9.27	PE	3658
			**	9.3 (V)	PE	5258
			**	9.20±0.1	EI	3624
			**	9.25±0.07	EI	4534
			**	9.26±0.06	EI	5503
			**	9.70	EI	4834
			**	9.25	CTS	3922
	C ₆ H ₆ (Bicyclo[2.2.0]hexa-2,5-diene)	5649-95-6	**	9.4 (V)	PE	4394
			**	9.40 (V)	PE	4453
	C ₃ (=CH ₂) ₃ (Cyclopropane, tris(methylene)-)	3227-90-5	**	9.0±0.1	S	4184
			**	8.94 (V)	PE	5431
	C ₆ H ₆ (Tricyclo[3.1.0.0 ^{2,6}]hex-3-ene)	659-85-8	**	8.54±0.04 (V)	PE	4716
			**	8.55 (V)	PE	4400
	C ₈ H ₈ (Pentacyclo[4.2.0.0 ^{2,5} .0 ^{3,8} .0 ^{6,7}]octane)	277-10-1	**	9.2±<0.1	EI	3735
			CH ₂ O	11.27±0.1	EI	3446
	C ₆ H ₅ OCH ₃ (Benzene, methoxy-)	100-66-3	HCHO	11.50	EI	3845
			**	11.55±<0.1	EI	3735
	(C ₆ H ₆)(CO) ₃ Cr (Chromium, (η ⁶ -benzene)tricarbonyl-)	12082-08-5	**	9.49±0.1	EI	3788
C₆H₆⁺²	C ₆ H ₆ (Benzene)	71-43-2	**	26.1	OTH	5141
C₆H₄D₂⁺	CD≡CCH ₂ CH ₂ C≡CD	XXXXX-XX-X	**	9.97±0.06	EI	3790
C₆H₇⁺	C ₇ H ₁₀ (Bicyclo[2.2.1]hept-2-ene)	498-66-8	CH ₃	10.46±0.01	EI	3535
			CH ₃	10.17±0.01	EI	3535
	C ₇ H ₁₀ (Tricyclo[2.2.1.0 ^{2,6}]heptane)	279-19-6	**	10.69	PI	4173
			**	10.69	PI	4173
C₆H₈⁺	C ₅ H ₇ (CH ₃) (1,3-Cyclopentadiene, 2-methyl-)	3727-31-9	**	8.4 (V)	PE	4373
			**	8.4 (V)	PE	4373
	C ₅ H ₇ (CH ₃) (1,3-Cyclopentadiene, 1-methyl-)	96-39-9	**	8.4 (V)	PE	4373
			**	8.72±0.01	PE	5407
	C ₂ H ₃ C≡CCH=CH ₂	13721-54-5	**	8.91±0.01	PE	5407
			**	8.54 (V)	PE	4829
	CH ₂ =C=CHC(CH ₃)=CH ₂	14763-81-6	**	8.54 (V)	PE	4829
			**	8.32 (V)	PE	4829
	1,2,trans-4-C ₆ H ₈	20130-95-4	**	8.56 (V)	PE	4829
			**	8.3±0.1	S	4235
	2,3,5-C ₆ H ₈	33755-64-5	**	8.31±0.02	PE	5432
			**	8.32	PE	3847
	cis-CH ₂ =CHCH=CHCH=CH ₂	2612-46-6	**	8.27	S	4235
			**	8.29	PE	3847
	trans-CH ₂ =CHCH=CHCH=CH ₂	821-07-8	**	8.30±0.02	PE	5432
			**	9.4 (V)	PE	4453
	C ₆ H ₈ (Bicyclo[2.2.0]hex-2-ene)	3097-63-0	**	9.4 (V)	PE	4453
			**	8.66±0.03 (V)	PE	4766
	C ₄ H ₆ (=CH ₂) ₂ (Cyclobutane, 1,2-bis(methylene)-)	14296-80-1	**	8.66±0.03 (V)	PE	4766

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_6H_8^+$	$C_4H_6(=CH_2)_2$	14296-80-1	**	8.77	PE	5265
	$C_4H_6(=CH_2)_2$ (Cyclobutane, 1,3-bis(methylene)-)	2045-78-5	**	9.08 ± 0.03 (V)	PE	4766
	$C_4H_7C \equiv CH$ (Cyclobutane, ethynyl-)	50786-62-4	**	10.02 (V)	PE	3997
			**	10.02 (V)	PE	5607
	C_6H_8 (1,3-Cyclohexadiene)	592-57-4	**	8.25 ± 0.02	PE	4702
			**	8.25 ± 0.03 (V)	PE	4828
			**	8.25	PE	5411
			**	8.32 (V)	PE	5010
	C_6H_8 (1,4-Cyclohexadiene)	628-41-1	**	8.80 (V)	PE	5538
			**	8.82 ± 0.02	PE	4702
			**	8.82	PE	5411
			**	8.82 (V)	PE	4531
			**	8.82 (V)	PE	5535
	$C_5H_5CH_3$ (1,3-Cyclopentadiene, methyl-)	26519-91-5	**	8.28 ± 0.05 (V)	PE	3688
	$C_5H_5CH_3$ (1,3-Cyclopentadiene, 1-methyl-)	96-39-9	**	8.40 (V)	PE	4179
	$C_5H_5CH_3$ (1,3-Cyclopentadiene, 2-methyl-)	3727-31-9	**	8.45 (V)	PE	4179
	$C_5H_6=CH_2$ (Cyclopentene, 3-methylene-)	930-26-7	**	8.40	PE	4347
	C_6H_8 (Cyclopropane cyclopropylidene-)	27567-82-4	**	8.93 (V)	PE	4963
	C_6H_8 (Tricyclo[3.1.0.0 ^{2,6}]hexane)	287-12-7	**	9.43 (V)	PE	4400
	$C_5H_8=CH_2$ (Cyclopentane, methylene-)	1528-30-9	H ₂	8.7	EI	5586
	$C_6H_{10}=CH_2$ (Cyclohexane, methylene-)	1192-37-6	CH ₄	11.2	EI	5586
	$C_{10}H_{16}$ (4,7-Methano-1H-indene, octahydro-, (3 α ,4 β ,7 β ,7 α)-)	2825-82-3		9.9 ± 0.1	PI	3918
$C_6H_9^+$	$CH \equiv C(CH_2)_3CH_3$	693-02-7	H	10.75 ± 0.05	EI	3585
	$CH_3C \equiv CCH_2CH_2CH_3$	764-35-2	H	10.81 ± 0.05	EI	3585
	C_6H_{10} (Cyclohexene)	110-83-8	H	11.8 ± 0.05	EI	3585
	$C_5H_8=CH_2$ (Cyclopentane, methylene-)	1528-30-9	H	12.13 ± 0.05	EI	3585
	$C_5H_7CH_3$ (Cyclopentene, 1-methyl-)	693-89-0	H	11.97 ± 0.05	EI	3585
	$C_{10}H_{15}CH_3$ (4,7-Methano-1H-indene, octahydro-8-methyl, stereoisomer)	50745-92-1		9.5 ± 0.1	PI	3918
	$C_{10}H_{15}C_2H_5$ (4,7-Methano-1H-indene, 5-ethyloctahydro-, (3 α ,4 β ,5 α ,7 β ,7 α)-)	32787-97-6		$\leq 10.2 \pm 0.1$	PI	3918
	$C_6H_{11}Cl$ (Cyclohexane, chloro-)	542-18-7		10.40 ± 0.02	PI	4078
$C_6H_{10}^+$	$C_5H_7(CH_3)$ (Cyclopentene, 3-methyl-)	1120-62-3	**	8.98 ± 0.05 (V)	PE	4954
	$trans-CH_2=CHC(CH_3)=CHCH_3$	XXXXX-XX-X	**	8.37 ± 0.05	EI	5483
	$CH_2=C(C_2H_5)CH=CH_2$	XXXXX-XX-X	**	8.81 ± 0.05	EI	5483
	$CH_2=C(CH_3)C(CH_3)=CH_2$	513-81-5	**	8.62	PE	3847
			**	8.72 (V)	PE	5010
			**	8.76 (V)	PE	3892
			**	8.54 ± 0.04	EI	4274

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_6H_{10}^+$	$CH_2=C(CH_3)C(CH_3)=CH_2$	513-81-5	**	8.66 ± 0.05	EI	5483
	$(CH_2=CHCH_2)_2$	592-42-7	**	9.25 (V)	PE	5314
			**	9.29 ± 0.05	EI	5483
			**	9.59 ± 0.02 (V)	PE	4010
	$C_4H_5C \equiv CH$	693-02-7	**	10.067 ± 0.005	PE	4575
			**	9.95 ± 0.05	EI	5483
			**	10.52 ± 0.05	EI	3585
	$CH_2=C(CH_3)CH_2CH=CH_2$	763-30-4	**	9.16 ± 0.05	EI	5483
	$C_3H_7C \equiv CCH_3$	764-35-2	**	9.366 ± 0.005	PE	4575
			**	9.37 ± 0.05	EI	5483
			**	9.97 ± 0.05	EI	3585
	$CH \equiv CC(CH_3)_3$	917-92-0	**	9.80 ± 0.05	EI	5483
			**	10.67 ± 0.02	EI	4126
	$CH_3CH_2CH(CH_3)C \equiv CH$	922-59-8	**	9.975 ± 0.008	PE	4575
			**	9.79 ± 0.05	EI	5483
	<i>trans</i> - $CH_2=C(CH_3)CH=CHCH_3$	926-54-5	**	8.47 (V)	PE	5010
			**	8.45 ± 0.05	EI	5483
	$(CH_3)_2C=CHCH=CH_2$	926-56-7	**	8.29	PE	5202
			**	8.26 ± 0.05	EI	5483
	$C_2H_5C \equiv CC_2H_5$	928-49-4	**	9.323 ± 0.005	PE	4575
			**	9.34 ± 0.05	EI	5483
	$CH_2=CHCH(CH_3)CH=CH_2$	1115-08-8	**	9.40 ± 0.05	EI	5483
	$CH_2=C(CH_3)CH=CHCH_3$	1118-58-7	**	8.47 ± 0.02	PE	4702
	<i>cis</i> - $CH_2=CHC(CH_3)=CHCH_3$	2787-43-1	**	8.39 ± 0.02	PE	4702
	<i>trans</i> - $CH_2=CHC(CH_3)=CHCH_3$	2787-45-3	**	16.6 ± 0.1 (V)	PE	4702
			**	8.46 ± 0.05	EI	5483
	$(CH_3)_2C=C=CHCH_3$	3043-33-2	**	8.69 (V)	PE	4019
			**	8.64 ± 0.05	EI	5483
	$C_2H_5C(=CH_2)CH=CH_2$	3404-63-5	**	8.79 ± 0.02	PE	4702
			**	8.79	PE	5411
	$CH_2=CHC(CH_3)=CHCH_3$	4549-74-0	**	8.39	PE	5411
	<i>trans,trans</i> -2,4- <i>n</i> - C_6H_{10}	5194-51-4	**	8.26 ± 0.05	EI	5483
	$(CH_3)_2CHCH_2C \equiv CH$	7154-75-8	**	10.055 ± 0.005	PE	4575
			**	9.83 ± 0.05	EI	5483
	$CH_2=C=C(CH_3)C_2H_5$	7417-48-3	**	8.74 ± 0.05	EI	5483
	$CH_2=C=CHCH(CH_3)_2$	13643-05-5	**	9.06 ± 0.05	EI	5483
	$(CH_3)_2CHC \equiv CCH_3$	21020-27-9	**	9.346 ± 0.007	PE	4575
			**	9.31 ± 0.05	EI	5483
	1,2- <i>n</i> - C_6H_{10}	592-44-9	**	9.00 ± 0.05	EI	5483
	1,3- C_6H_{10}	592-48-3	**	8.53 ± 0.02	PE	4702
	2,3- <i>n</i> - C_6H_{10}	592-49-4	**	8.76 ± 0.05	EI	5483
	2,4- C_6H_{10}	592-46-1	**	8.09 ± 0.03 (V)	PE	4828
	2,4- <i>trans,cis</i> - C_6H_{10}	5194-50-3	**	8.25 ± 0.02	PE	4702
			**	8.26	PE	5202
			**	8.24 ± 0.05	EI	5483
	2,4- <i>cis,cis</i> - C_6H_{10}	6108-61-8	**	8.18 ± 0.02	PE	4702
	<i>(tert-C_4H_9)C \equiv CH</i>	917-92-0	**	9.923 ± 0.010	PE	4575
	<i>cis</i> -1,4- <i>n</i> - C_6H_{10}	7318-67-4	**	9.04 ± 0.05	EI	5483
	<i>trans</i> -1,4- <i>n</i> - C_6H_{10}	7319-00-8	**	8.98 ± 0.05	EI	5483
	<i>trans</i> -1,3- <i>n</i> - C_6H_{10}	20237-34-7	**	8.54 ± 0.05	EI	5483
	<i>trans,trans</i> - $CH_3CH=CHCH=CHCH_3$	5194-51-4	**	8.09	PE	3847
			**	8.93 (V)	PE	3892
	C_6H_{10}	186-04-9	**	9.6 (V)	PE	4453
	(Bicyclo[2.2.0]hexane)					
	$(C_3H_5)_2$	5685-46-1	**	9.6 (V)	PE	5344
	(1,1'-Bicyclopropyl)		**	9.12 ± 0.05	EI	5483
	$C_4H_7CH=CH_2$	2597-49-1	**	9.44 (V)	PE	4347
	(Cyclobutane, ethenyl-)		**	9.44 (V)	PE	5607
			**	8.70 ± 0.05	EI	5483

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₆H₁₀⁺	C ₆ H ₁₀ (Cyclohexene)	110-83-8	**	8.94±0.01	PI	5556
			**	9.11 (V)	PE	4249
			**	9.12 (V)	PE	4267
			**	9.12 (V)	PE	4285
			**	9.12 (V)	PE	5538
	C ₅ H ₈ =CH ₂ (Cyclopentane, methylene-)	1528-30-9	**	9.57±0.05	EI	3585
			**	8.55±0.01	PI	3585
			**	9.14 (V)	PE	4669
			**	7.2	EI	5586
			**	9.26±0.05	EI	3585
	C ₅ H ₇ -CH ₃ (Cyclopentene, 1-methyl-)	693-89-0	**	8.55±0.01	PI	3585
			**	8.60±0.01	PI	5556
			**	9.12±0.05	EI	3585
			**	8.95±0.01	PI	5556
			**	9.12	PE	4608
	CH ₃ C ₅ H ₇ (Cyclopentene,3-methyl-)	1120-62-3	**	8.66±0.05	EI	5483
			**	8.58±0.05	EI	5483
	C ₃ H ₅ C(CH ₃)=CH ₂ (Cyclopropane, (1-methylethenyl)-)	4663-22-3	**	9.12	PE	4608
	C ₃ H(CH ₃) ₃ (Cyclopropene, 1,3,3-trimethyl-)	3664-56-0	**	8.66±0.05	EI	5483
			**	8.58±0.05	EI	5483
	C ₆ H ₁₀ (Spirohexane)	157-45-9	**	9.66 (V)	PE	5361
	C ₆ H ₁₀ =CH ₂ (Cyclohexane,methylene-)	1192-37-6	CH ₂	11.7	EI	5586
	C ₆ H ₁₀ (CH ₃) ₂ (Cyclohexane, 1,2-dimethyl-, <i>cis</i> -)	2207-01-4	2CH ₃	10.46±0.1	EI	3581
	C ₆ H ₁₀ (CH ₃) ₂ (Cyclohexane, 1,2-dimethyl-, <i>trans</i> -)	6876-23-9	2CH ₃	10.63±0.1	EI	3581
	C ₁₀ H ₁₅ CH ₃	XXXXXX-XX-X		9.8±0.1	PI	3918
	C ₁₀ H ₁₅ CH ₃ (4,7-Methano-1 <i>H</i> -indene, octahydro-2-methyl-, (2α,3αβ,4α,7α,7aβ)-)	50745-90-9		10.0±0.1	PI	3918
	(CH ₃) ₂ CHC ₂ H ₄ CHO	1119-16-0	H ₂ O	10.00	EI	5264
C ₂ H ₅ CH(CH ₃)CH ₂ CHO	15877-57-3	H ₂ O	9.90	EI	5264	
<i>n</i> -C ₅ H ₁₁ CHO	66-25-1	H ₂ O	9.80	EI	5264	
C ₆ H ₁₁ OH (Cyclohexanol)	108-93-0	H ₂ O	10.2±0.2	EI	4617	
C ₆ H ₁₁ Cl (Cyclohexane, chloro-)	542-18-7	H ₂ O	10.4±0.05	EI	4548	
			10.10±0.05	PI	4078	
C₆H₉D⁺	C ₆ H ₉ D ₂ OH (Cyclohexanol, 3,5- <i>d</i> ₂ -)	XXXXXX-XX-X	HDO	11.3±0.10	EI	4548
	C ₆ H ₉ D ₂ OH (Cyclohexanol, 4,4- <i>d</i> ₂ -)	XXXXXX-XX-X	HDO	10.5±0.06	EI	4548
	C₆H₈D₂⁺	C ₆ H ₉ D ₂ OH (Cyclohexanol, 3,5- <i>d</i> ₂ -)	XXXXXX-XX-X	H ₂ O	10.5±0.10	EI
C ₆ H ₉ D ₂ OH (Cyclohexanol, 4,4- <i>d</i> ₂ -)		XXXXXX-XX-X	H ₂ O	11.1±0.04	EI	4548
C₆H₇D₃⁺		C ₆ H ₇ D ₄ OH (Cyclohexan-3,3,5,5- <i>d</i> ₄ -ol)	XXXXXX-XX-X	HDO	10.7±0.2	EI
	C₆H₆D₄⁺	C ₆ H ₇ D ₄ OH (Cyclohexan-3,3,5,5- <i>d</i> ₄ -ol)	21273-04-1	H ₂ O	10.2±0.2	EI

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_6H_{11}^+$	C_6H_{12} (Cyclohexane)	110-82-7	H	11.32 ± 0.05	PI	4078
	$C_6H_{11}Cl$ (Cyclohexane, chloro-)	542-18-7		10.20 ± 0.05	PI	4078
	$C_6H_{11}Br$ (Cyclohexane, bromo-)	108-85-0		9.85 ± 0.05	PI	4078
$C_6H_{12}^+$	$(CH_3)_3CCH=CH_2$	558-37-2	**	9.450 ± 0.005	PE	3957
			**	9.7 (V)	PE	3940
	$(CH_3)_4C=C$	563-78-0	**	8.41 (V)	PE	5535
			**	9.072 ± 0.005	PE	3957
	$(CH_3)_2C=C(CH_3)_2$	563-79-1	**	8.26	PE	3533
			**	8.271 ± 0.005	PE	3957
			**	8.30 (V)	PE	5600
			**	8.42 (V)	PE	4243
			**	8.46 (V)	PE	4459
			**	10.52 (V)	PE	4747
	$(CH_3)_2CHCH_2CH=CH_2$	691-37-2	**	9.452 ± 0.003	PE	3957
	$(C_2H_5)_2C=CH_2$	760-21-4	**	9.061 ± 0.005	PE	3957
	$C_2H_5CH_2C(CH_3)=CH_2$	763-29-1	**	9.076 ± 0.005	PE	3957
	1- C_6H_{12}	592-41-6	**	9.31	PE	4033
			**	9.37 ± 0.02	PE	4695
			**	9.478 ± 0.003	PE	3957
			**	9.65 ± 0.01 (V)	PE	4939
			**	9.33	EI	4033
	2- C_6H_{12}	592-43-8	**	8.88 ± 0.02	PE	4695
	3- <i>trans</i> - C_6H_{12}	13269-52-8	**	8.83 ± 0.02	PE	4695
			**	9.14 ± 0.01 (V)	PE	4939
	<i>cis</i> -(CH_3) ₂ CHCH=CHCH ₃	691-38-3	**	8.976 ± 0.005	PE	3957
	<i>cis</i> -2- C_6H_{12}	7688-21-3	**	8.969 ± 0.005	PE	3957
			**	9.15 ± 0.01 (V)	PE	4939
	<i>cis</i> -3- C_6H_{12}	7642-09-3	**	8.954 ± 0.005	PE	3957
			**	9.15 ± 0.01 (V)	PE	4939
	<i>trans</i> -(CH_3) ₂ CHCH=CHCH ₃	674-76-0	**	8.972 ± 0.005	PE	3957
	<i>trans</i> -2- C_6H_{12}	4050-45-7	**	8.966 ± 0.005	PE	3957
			**	9.16 ± 0.01 (V)	PE	4939
	<i>trans</i> -3- C_6H_{12}	13269-52-8	**	8.965 ± 0.005	PE	3957
	C_6H_{12} (Cyclohexane)	110-82-7	**	9.88 ± 0.01	S	3757
			**	9.88 ± 0.01	PI	4078
			**	9.89 ± 0.01	PI	5556
			**	9.84	PE	4319
			**	9.87	PE	4056
			**	9.88	PE	5043
			**	10.3 (V)	PE	3997
			**	9.83 ± 0.05	EI	4319
	$CH_3C_5H_9$ (Cyclopentane, methyl-)	96-37-7	**	10.34 ± 0.04	PI	5556
			**	18.3 ± 0.1	PE	4702
$C_6D_{12}^+$	C_6D_{12} (Cyclohexane- <i>d</i> ₁₂)	1735-17-7	**	9.91 ± 0.01	S	3757
$C_6H_{13}^+$	1- C_6H_{13}	2679-29-0	**	7.92 ± 0.06	EI	4895
	2- C_6H_{13}	2493-44-9	**	7.38	EI	4895
	<i>n</i> - $C_3H_7C(CH_3)_2$	21058-26-4	**	6.82	EI	4895

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_6H_{11}^+$	$n-C_6H_{11}$	110-54-3	** **	10.22 18.7±0.1 (V)	PE PE	4056 4702
	(iso- C_7H_7) ₂	79-29-8	**	17.9±0.1 (V)	PE	4702
	<i>tert</i> - $C_7H_7CH_2CH_3$	75-83-2	**	17.6±0.1 (V)	PE	4702
$C_7H_6^+$	C_7H_6 (Bicyclo[3.2.0]hepta-1,4,6-triene)	35295-58-0	**	8.41 (V)	PE	4779
	C_7H_6 (Bicyclo[4.1.0]hepta-1,3,5-triene)	4646-69-9	**	8.82 (V)	PE	4063
	$C_7H_7(=C=CH_2)$ (1,3-Cyclopentadiene, 5-ethenylidene-)	27041-32-3	**	8.29 (V)	PE	4779
	<i>cis</i> - $C_7H_7(C\equiv CH)_2$ (Cyclopropane, <i>cis</i> -1,2-diethynyl-)	59502-33-9	**	8.90±0.02	PE	4374
	<i>trans</i> - $C_7H_7(C\equiv CH)_2$ (Cyclopropane, <i>trans</i> -1,2-diethynyl-)	35295-57-9	**	9.00±0.02	PE	4374
	$C_6H_5CH_2CN$ (Benzeneacetonitrile)	140-29-4	HCN	12.19	EI	4934
	$C_6H_5(CN)CH_3$ (Benzonitrile, 4-methyl-)	104-85-8	HCN	12.22	EI	4934
	C_7H_7CN (2,4,6-Cycloheptatriene-1-carbonitrile)	13612-59-4	HCN	11.19	EI	4934
$C_7H_7^+$	C_7H_7 (2,4,6-Cycloheptatrien-1-yl) (JC-Mean value of Jahn-Teller components)	3551-27-7	** **	6.28±0.02 6.74±0.05	PE EI	4820 3789
	$C_6H_5CH_2$ (Methyl, phenyl-)	2154-56-5	** **	7.20±0.02 7.20±0.02	PE PE	4722 4898
				7.43±0.06 (V)	PE	4609
	$C_6H_5CH_3$ (Benzene, methyl-)	108-88-3	H	10.71±0.03	PI	5120
			H	10.71	EI	5293
			H	11.8	EI	4115
	C_7H_8 (1,3,5-Cycloheptatriene)	544-25-2	H	9.36±0.02	PI	5120
			H	10.73	EI	4115
	<i>trans</i> - $CH_2=CHCH=CHCH=CHCH_3$	17679-93-5		12.2±0.15	PE	5432
	$C_6H_4(CH_3)_2$ (Benzene, 1-2-dimethyl-)	95-47-6	CH ₃	11.80±0.2	EI	4199
	$C_6H_4(CH_3)_2$ (Benzene, 1,3-dimethyl-)	108-38-8	CH ₃	11.80±0.2	EI	4199
	$C_6H_4(CH_3)_2$ (Benzene, 1,4-dimethyl-)	106-42-3		11.5±0.3	EI	4223
			CH ₃	11.85±0.2	EI	4199
	$C_6H_5C_2H_5$ (Benzene, ethyl-)	100-41-4	CH ₃	10.06	EI	5293
	$C_6H_5CH(CH_3)_2$ (Benzene, 1-methylethyl-)	98-82-8	C ₂ H ₅	9.91	EI	5293
	$C_6H_5CH_2CH_2CH_3$ (Benzene, propyl-)	103-65-1	C ₂ H ₅	9.85	EI	5293
	$C_6H_5C_4H_9$ (Benzene, butyl-)	104-51-8	C ₃ H ₇	9.93	EI	5293
	$C_6H_5CH(CH_3)C_2H_5$ (Benzene, 1-methylpropyl)	135-98-8	C ₃ H ₇	10.00	EI	5293
	$C_6H_5CH_2CH(CH_3)_2$ (Benzene, 2-methylpropyl)	538-93-2	C ₃ H ₇	9.99	EI	5293
	$(C_6H_5)_2CH_2$ (Benzene, 1,1'-methylenebis-)	101-81-5	C ₆ H ₅	11.5±0.1	EI	3807

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_7H_7^+$	$C_6H_5C_6H_4CH_3$ (1,1'-Biphenyl, 4-methyl-)	644-08-6		13.7 ± 0.3	EI	4223
	$C_6H_5CH_2CH_2C_6H_4CH_3$ (Benzene, 1-methyl-2-(2-phenylethyl)-)	34403-05-9		11.2 ± 0.3	EI	5230
	$C_6H_5CH_2CH_2C_6H_3CH_3$ (Benzene, 1-methyl-3-(2-phenylethyl)-)	34403-06-0		11.1 ± 0.2	EI	5230
	$C_6H_5CH_2CH_2C_6H_4CH_3$ (Benzene, 1-methyl-4-(2-phenylethyl)-)	14310-20-4		11.3 ± 0.4	EI	5230
	$C_6H_5(CH_2)_3C_6H_5$ (Benzene, 1,1'-(1,3-propanediyl)bis-)	1081-75-0		11.6	EI	4925
	$C_6H_5CH_2CH_2C_6H_5$ (1,3,5-Cycloheptatriene, 7-(2-phenylethyl)-)	712-32-6		11.6 9.3 ± 0.1	EI EI	5230 5230
	$C_6H_5CH_2N(CH_3)_2$ (Benzenemethanamine, dimethyl-)	28262-13-7	C_2H_6N	9.62	PI	5543
	$C_6H_5CH_2CH_2N(CH_3)_2$ (Benzeneethanamine, dimethyl-)	29088-49-1	C_3H_8N	10.55	PI	5543
	$C_6H_5(CH_3)_2CHO$ (Benzaldehyde, 2,4-dimethyl-)	15764-16-6		11.2	EI	4051
	$C_6H_5(CH_3)_2CHO$ (Benzaldehyde, 2,5-dimethyl-)	5779-94-2		11.2	EI	4051
	$C_6H_5(CH_3)_2CHO$ (Benzaldehyde, 3,4-dimethyl-)	5973-71-7		11.1	EI	4051
	$C_6H_5(CH_3)COCH_3$ (Ethanone, 1-(4-methylphenyl)-)	122-00-9		13.8 ± 0.3	EI	4223
	$C_6H_5(CH_3)COOH$ (Benzoic acid, 3-methyl-)	99-04-7	COOH	12.48 ± 0.2	EI	3973
	$C_6H_5(CH_3)COOH$ (Benzoic acid, 4-methyl-)	99-94-5	COOH	12.55 ± 0.2	EI	3973
	$C_6H_5CH_2CH_2OCOCH_3$ (Acetic acid, 2-phenylethyl ester)	103-45-7		12.50	EI	3590
	$CH_3C_6H_4NO_2$ (Benzene, 1-methyl-2-nitro-)	88-72-2	NO_2	11.0 ± 0.1	PI	5437
	$C_6H_5(NO_2)CH_3$ (Benzene, 1-methyl-3-nitro-)	99-08-1	NO_2	13.1 ± 0.3 11.58 ± 0.1	EI EI	4223 3447
	$CH_3C_6H_4NO_2$ (Benzene, 1-methyl-4-nitro-)	99-99-0	NO_2	12.1 ± 0.3 11.3 ± 0.1	EI PI	4223 5437
	$C_6H_5CH_2Cl$ (Benzene, chloromethyl-)	25168-05-2	Cl	11.80 ± 0.1 12.3 ± 0.3 10.16 ± 0.05	EI EI PI	3447 4223 5515
	$C_6H_5ClCH_3$ (Benzene, 1-chloro-2-methyl-)	95-49-8		11.21 ± 0.1	EI	3777
	$C_6H_5ClCH_3$ (Benzene, 1-chloro-3-methyl-)	108-41-8		11.34 ± 0.1	EI	3777
	$C_6H_5ClCH_3$ (Benzene, 1-chloro-4-methyl-)	106-43-4		11.42 ± 0.1	EI	3777
	$C_6H_5BrCH_3$ (Benzene, 1-bromo-2-methyl-)	95-46-5		11.5 ± 0.3 11.14 ± 0.1	EI EI	4223 3777
	$C_6H_5BrCH_3$ (Benzene, 1-bromo-3-methyl-)	591-17-3		11.22 ± 0.1	EI	3777
	$C_6H_5BrCH_3$ (Benzene, 1-bromo-4-methyl-)	106-38-7		11.1 ± 0.3	EI	4223
	$C_6H_5ICH_3$ (Benzene, 1-iodo-2-methyl-)	615-37-2		11.22 ± 0.1 11.14 ± 0.1	EI EI	3777 3777
	$C_6H_5ICH_3$ (Benzene, 1-iodo-3-methyl-)	625-95-6		11.0 ± 0.3	EI	4223

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_7H_7^+$	$C_6H_5ICH_3$	625-95-6		11.26 ± 0.1	EI	3777
	$C_6H_5ICH_3$	624-31-7		11.15 ± 0.1	EI	3777
	(Benzene, 1-iodo-4-methyl-)					
$C_7H_5D_2^+$	$C_6H_5CD_2$	2154-54-3	**	7.22 ± 0.02	PE	4722
	(Methyl- d_2 , phenyl-)		**	7.22 ± 0.02	PE	4898
$C_7H_8^+$	$C_6H_5(n-C_4H_9)$ (Benzene, butyl-)	104-51-8	C_3H_6	9.73 ± 0.04	PI	4928
	$C_6H_5(iso-C_4H_9)$ (Benzene, (2-methylpropyl)-)	538-93-2	C_3H_6	9.76 ± 0.04	PI	4928
	$C_6H_5(n-C_5H_{11})$ (Benzene, pentyl-)	538-68-1		9.72 ± 0.04	PI	4928
	$CH_2=C=C(CH_3)CH=CH_2$	57212-57-4	**	8.39 (V)	PE	4397
	$C_6H_5CH_3$	108-88-3	**	8.82	PI	3753
	(Benzene, methyl-)		**	8.72	PE	3955
			**	8.78 ± 0.02	PE	3854
			**	8.80	PE	3868
			**	8.82	PE	4621
			**	8.82 (V)	PE	4280
			**	8.84	PE	5574
			**	8.85 ± 0.015 (V)	PE	4107
			**	8.85 (V)	PE	4884
			**	8.900 ± 0.03 (V)	PE	4340
			**	9.0 ± 0.03 (V)	PE	3713
			**	9.00 (V)	PE	5258
			**	8.67	EI	3845
			**	8.80 ± 0.1	EI	3788
			**	8.81	EI	4115
			**	8.82	EI	5293
			**	8.89 ± 0.03	EI	3626
			**	8.71	CTS	3546
			**	8.91	CTS	4029
	C_7H_8	121-46-0	**	8.6 (V)	PE	3724
	(Bicyclo[2.2.1]hepta-2,5-diene)		**	8.69 (V)	PE	3687
			**	8.69 (V)	PE	5538
			**	8.70 (V)	PE	3509
			**	8.73 (V)	PE	5010
			**	8.73 (V)	PE	5367
			**	8.69 (V)	PE	3824
	C_7H_8	544-25-2	**	8.50 (V)	PE	5444
	(1,3,5-Cycloheptatriene)		**	8.52	EI	4115
	C_7H_8	765-46-8	**	8.14	PE	3576
	(Spiro[2.4]hepta-4,6-diene)		**	8.33 (V)	PE	4142
	C_7H_8 (Tetracyclo[3.2.0.0.0 ^{2,7} .0 ^{4,6}]heptane)	XXXXX-XX-X	**	8.33 (V)	PE	4142
	C_7H_8 (Tricyclo[4.1.0.0 ^{2,7}]hept-3-ene)	35618-58-7	**	8.82 (V)	PE	5441
	$trans-CH_2=CHCH=CHCH=CHCH_3$	17679-93-5		12.4 ± 0.15	PE	5432
	$C_6H_5C_4H_9$	104-51-8	$CH_2=CHCH_3$	10.10 ± 0.1	EI	3629
	(Benzene, butyl-)					
	$C_6H_5(CH_2)_3C_6H_5$ (Benzene, 1,1'-(1,3-propanediyl)bis-)	1081-75-0		9.7 ± 0.1	EI	4925
	$C_6H_5CH_2CH_2C_6H_5$	712-32-6		10.0 ± 0.1	EI	5230
	(1,3,5-Cycloheptatriene, 7-(2-phenylethyl)-)			9.0 ± 0.1	EI	5230

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_7H_8^+$	$C_6H_5(OCH_3)CH_3$ (Benzene, 1-methoxy-3-methyl-)	100-84-5	CH_2O	11.22 ± 0.1	EI	3446
	$C_6H_5(OCH_3)CH_3$ (Benzene, 1-methoxy-4-methyl-)	104-93-8	CH_2O	11.11 ± 0.1	EI	3446
	$(C_6H_5CH_3)(CO)_3Cr$ (Chromium, tricarbonyl[(1,2,3,4,5,6- η)-methylbenzene]-)	12083-24-8	$HCHO$	11.23	EI	3845
				8.31 ± 0.1	EI	3788
$C_7H_8^{+2}$	$C_6H_5CH_3$ (Benzene, methyl-)	108-88-3	**	24.2	OTH	5141
$C_7H_9^+$	C_7H_{10} (Bicyclo[2.2.1]hept-2-ene)	498-66-8	H	11.0 ± 0.01	EI	3535
	C_7H_{10} (Tricyclo[2.2.1.0 ^{2,6}]heptane)	279-19-6	H	11.3 ± 0.01	EI	3535
	$C_{10}H_{16}$ (Tricyclo[3.3.1.1 ^{3,7}]decane)	281-23-2		10.69	PI	4173
	C_7H_7Br (Bicyclo[2.2.1]hept-2-ene, 5-bromo-, <i>endo</i> -)	5810-82-2	Br	10.1	EI	5633
	C_7H_7Br (Bicyclo[2.2.1]hept-2-ene, 5-bromo-, <i>exo</i> -)	5889-54-3	Br	10.2	EI	5633
$C_7H_{10}^+$	$CH \equiv CC(C_2H_5) = CHCH_3$	14272-82-3	**	8.70 ± 0.01	PE	5407
	$C_2H_5C \equiv CC(CH_3) = CH_2$	23056-94-2	**	8.66 ± 0.01	PE	5407
	$CH_2 = CHC(CH_3) = CHCH = CH_2 - E$	24587-26-6		8.28 (V)	PE	4380
	$CH_2 = C = C(CH_3)C(CH_3) = CH_2$	39968-66-6	**	8.10 (V)	PE	4829
	$CH_2 = C(CH_3)CH = CHCH = CH_2 - E$	41233-72-1		8.31 (V)	PE	4380
	<i>trans</i> - $CH_2 = CHCH = CHCH = CHCH_3$	17679-93-5	**	7.96 ± 0.02	PE	5432
			**	8.07	PE	3847
	C_7H_{10} (Bicyclo[2.2.1]hept-2-ene)	498-66-8	**	8.95	PE	5481
			**	8.95 (V)	PE	3509
			**	8.97 (V)	PE	3687
			**	8.97 (V)	PE	4249
			**	8.97 (V)	PE	4285
			**	8.97 (V)	PE	5538
			**	8.80 ± 0.01	EI	3535
	C_7H_{10} (Bicyclo[4.1.0]hept-2-ene)	2566-57-6	**	8.69 (V)	PE	3849
	C_7H_{10} (1,3-Cycloheptadiene)	4054-38-0	**	8.31 ± 0.03 (V)	PE	4828
	$C_6H_8 = CH_2$ (Cyclohexene, 4-methylene-)	13407-18-6	**	9.27 (V)	PE	4249
	$C_5H_6(=CH_2)_2$ (Cyclopentane, 1,2-bis(methylene)-)	20968-70-1	**	8.58	PE	5265
	$C_3H_5C(CH_3) = C = CH_2$ (Cyclopropane, (1-methyl-1,2-propadienyl)-)	51549-86-1	**	8.83	PE	4608
	C_7H_{10} (Spiro[2.4]hept-4-ene)	52708-23-3	**	8.48 (V)	PE	4347
	C_7H_{10} (Tricyclo[2.2.1.0 ^{2,6}]heptane)	279-19-6	**	9.40 (V)	PE	3741
			**	8.92 ± 0.01	EI	3535
	C_7H_{10} (Tricyclo[4.1.0.0 ^{2,7}]heptane)	287-13-8	**	8.72 (V)	PE	4400
			**	8.72 (V)	PE	5441
	$C_{10}H_{15}CH_3$ (4,7-Methano-1 <i>H</i> -indene, octahydro-8-methyl-, stereoisomer)	50745-92-1		9.5 ± 0.1	PI	3918

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_7H_{11}^+$	$C_{10}H_{16}$ (4,7-Methano-1 <i>H</i> -indene, octahydro-, (3 α ,4 β ,7 β ,7 α)-)	2825-82-3		9.9 ± 0.1	PI	3918
	$C_{10}H_{15}CH_3$ (2-Methyl-exo-tricyclo[5.2.1.0 ^{2,6}]decane)	XXXXX-XX-X		$\leq 10.2 \pm 0.1$	PI	3918
	$C_{10}H_{15}CH_3$ (4,7-Methano-1 <i>H</i> -indene, octahydro-2-methyl-, (2 α ,3 $\alpha\beta$,4 α ,7 α ,7 $\alpha\beta$)-)	50745-90-9		10.0 ± 0.1	PI	3918
	$C_{10}H_{15}C_2H_5$ (4,7-Methano-1 <i>H</i> -indene, 5-ethyloctahydro-, (3 α ,4 β ,5 α ,7 β ,7 α)-)	32787-97-6		$\leq 10.2 \pm 0.1$	PI	3918
$C_7H_{12}^+$	$C_5H_7(C_2H_5)$	694-35-9	**	8.91 ± 0.05 (V)	PE	4954
	(Cyclopentene, 3-ethyl-)		**	8.88 ± 0.01	PI	5556
	$C_5H_{11}C \equiv CH$	628-71-7	**	10.044 ± 0.005	PE	4575
	$CH_2 = CHCH_2CH = C(CH_3)_2$	763-88-2	**	8.70 (V)	PE	4211
	$(CH_3)_2C = C = C(CH_3)_2$	1000-87-9	**	8.47 (V)	PE	4019
			**	8.53 (V)	PE	5362
	$(C_2H_5)_2C(CH_3)_2$	1112-35-2	**	9.55 (V)	PE	3994
	$C_4H_9C \equiv CCH_3$	1119-65-9	**	9.326 ± 0.005	PE	4575
	$(CH_3)_2CH(CH_2)_2C \equiv CH$	2203-80-7	**	10.015 ± 0.005	PE	4575
	$C_2H_5C \equiv CC_4H_7$	2586-89-2	**	9.260 ± 0.005	PE	4575
	$CH_2 = CH(CH_2)_3CH = CH_2$	3070-53-9	**	9.52 ± 0.02 (V)	PE	4010
	$(CH_3)_2CHCH_2C \equiv CCH_3$	53566-37-3	**	9.320 ± 0.005	PE	4575
	(<i>tert</i> -C ₄ H ₉)C \equiv CCH ₃	999-78-0	**	9.276 ± 0.010	PE	4575
	C_7H_{12} (Bicyclo[2.2.1]heptane)	279-23-2	**	10.15 (V)	PE	3509
			**	10.2 (V)	PE	3687
	C_7H_{12} (Bicyclo[4.1.0]heptane)	286-08-8	**	9.46 (V)	PE	3849
	C_7H_{12} (Cycloheptene(Z))	628-92-2	**	9.05 ± 0.15	EI	5532
			**	9.12 (V)	PE	4285
	$C_6H_{10} = CH_2$ (Cyclohexane, methylene-)	1192-37-6	**	9.12 ± 0.02 (V)	PE	4338
			**	9.13 (V)	PE	4249
			**	9.7	EI	5586
	$CH_3C_6H_9$ (Cyclohexene, 1-methyl-)	591-49-1	**	8.67 ± 0.02	PI	5556
	$CH_3C_6H_9$ (Cyclohexene, 3-methyl-)	591-48-0	**	8.89 ± 0.01	PI	5556
	$CH_3C_6H_9$ (Cyclohexene, 4-methyl-)	591-47-9	**	8.91 ± 0.01	PI	5556
	$C_2H_5C_5H_7$ (Cyclopentene, 1-ethyl-) (Cyclopentene, 3-ethyl-)	2146-38-5	**	8.53 ± 0.01	PI	5556
	C_7H_{12} (Cyclopropene, tetramethyl)	26385-95-5	**	8.52 (V)	PE	5480
$C_7H_{13}^+$	$C_6H_{10}(CH_3)_2$ (Cyclohexane, 1,2-dimethyl-, <i>cis</i> -)	2207-01-4	CH ₃	10.55 ± 0.05	EI	3581
	$C_6H_{10}(CH_3)_2$ (Cyclohexane, 1,2-dimethyl-, <i>trans</i> -)	6876-23-9	CH ₃	10.73 ± 0.05	EI	3581
$C_7H_{14}^+$	<i>trans</i> -(CH ₃) ₃ CCH=CHCH ₂	690-08-4	**	8.908 ± 0.008	PE	3957
	(CH ₃) ₃ CC(CH ₃)=CH ₂	594-56-9	**	9.016 ± 0.007	PE	3957
	(CH ₃) ₃ CCH ₂ CH=CH ₂	762-62-9	**	9.399 ± 0.003	PE	3957
			**	9.6 (V)	PE	3940
	(CH ₃) ₂ CHCH ₂ C(CH ₃)=CH ₂	2213-32-3	**	9.025 ± 0.005	PE	3957
	CH ₃ (CH ₂) ₃ C(CH ₃)=CH ₂	6094-02-6	**	9.039 ± 0.005	PE	3957

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_7H_{11}^+$	$C_2H_2C(CH_3)=C(CH_3)_2$	10574-37-5	**	8.213 ± 0.005	PE	3957
	1- C_7H_{11}	592-76-7	**	9.27 ± 0.02	PE	4695
			**	9.442 ± 0.003	PE	3957
	2- C_7H_{11}	592-77-8	**	8.84 ± 0.02	PE	4695
	3- C_7H_{11}	592-78-9	**	8.77 ± 0.02	PE	4695
	<i>cis</i> -(CH_3) ₃ CCH=CHCH ₃	762-63-0	**	8.922 ± 0.008	PE	3957
	<i>cis</i> -(CH_3) ₂ CHCH ₂ CH=CHCH ₃	13151-17-2	**	8.917 ± 0.005	PE	3957
	<i>trans</i> -CH ₃ CH ₂ C(CH ₃)HCH=CHCH ₃	3683-22-5	**	8.912 ± 0.005	PE	3957
	<i>trans</i> -(CH_3) ₂ CHCH ₂ CH=CHCH ₃	7385-82-2	**	8.919 ± 0.005	PE	3957
	C_7H_{14}	291-64-5	**	9.97	PE	4319
	(Cycloheptane)		**	9.88 ± 0.05	EI	4319
	$CH_3C_6H_{11}$ (Cyclohexane,methyl-)	108-87-2	**	9.76 ± 0.03	PI	5556
$C_7H_{15}^+$	$C_2H_5C_5H_9$	1640-89-7	**	10.12 ± 0.02	PI	5556
	(Cyclopentane,ethyl-)					
$C_7H_{15}^+$	1- C_7H_{15}	3356-67-0	**	7.90 ± 0.06	EI	4895
	2- C_7H_{15}	3474-30-4	**	7.35 ± 0.06	EI	4895
	<i>n</i> - $C_4H_9C(CH_3)_2$	40626-78-6	**	6.79	EI	4895
$C_8H_2^+$	CH≡CC≡CC≡CC≡CH	XXXXX-XX-X	**	9.09 ± 0.02	PE	4460
$C_8H_6^+$	C_8H_6	XXXXX-XX-X	**	8.95 ± 0.1	EI	4714
	$CH_3C \equiv CC \equiv CC \equiv CCH_3$	1072-20-4	**	8.60	PE	4048
	$C_6H_3C \equiv CH$	536-74-3	**	8.75	PE	3938
	(Benzene, ethynyl-)					
			**	8.78 (V)	PE	4334
			**	8.78 (V)	PE	5259
			**	8.82 ± 0.02 (V)	PE	5409
			**	8.88 ± 0.02 (V)	PE	3854
	C_8H_6	4026-23-7	**	7.87 ± 0.02 (V)	PE	4945
	(Bicyclo[4.2.0]octa-1,3,5,7-tetraene)					
$C_8H_8^+$	$C_6H_5CH=CH_2$	100-42-5	**	8.40 ± 0.02	PE	3854
	(Benzene, ethenyl-)					
			**	8.42	PE	3938
			**	8.48 (V)	PE	4884
			**	8.49 (V)	PE	3964
			**	8.50 (V)	PE	4347
			**	8.55 (V)	PE	3781
			**	8.55 (V)	PE	5632
			**	8.23 ± 0.1	EI	4714
			**	8.28 ± 0.04	EI	4097
	C_8H_8	37846-63-2	**	8.50 (V)	PE	3933
	(Bicyclo[2.2.1]hepta-2,5-diene, 7-methylene-)					
	C_8H_8	694-87-1	**	8.66 ± 0.03 (V)	PE	4828
	(Bicyclo[4.2.0]octa-1,3,5-triene)					
			**	8.66 (V)	PE	4063
	$C_4(=CH_2)_4$	3227-91-6	**	8.35	PE	4728
	(Cyclobutane, tetrakis(methylene)-)					
	$C_6H_4(=CH_2)_2$	502-86-3	**	7.87 ± 0.05 (V)	PE	4510
	(1,4-Cyclohexadiene,3,6-bis(methylene)-)					
	C_8H_8	49852-40-6	**	8.9	PE	4180
	(1,5-Cyclooctadiyne)					
	C_8H_8	629-20-9	**	8.0	PE	3999
	(1,3,5,7-Cyclooctatetraene)					

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_8H_8^+$	C_8H_8 (Pentacyclo[3.3.0.0 ^{1,4} .0 ^{3,7} .0 ^{6,8}]octane)	20656-23-9	**	8.18	PE	4955
	C_8H_8 (Pentacyclo[4.2.0.0 ^{2,5} .0 ^{3,8} .0 ^{1,7}]octane)	277-10-1	**	8.46	PE	4955
			**	8.4 ± <0.1	EI	3735
			**	9.6	PE	4726
	C_8H_8 (Tetracyclo[3.2.0.0 ^{2,7} .0 ^{4,6}]heptane, 3-methylene-)	38898-42-9	**	8.48 (V)	PE	4142
	C_8H_8 (Tricyclo[3.2.1.0 ^{2,8}]octa-2,6-diene)	XXXXX-XX-X	**	8.5 (V)	PE	4034
	C_8H_8 (Tricyclo[4.2.0.0 ^{2,5}]octa-3,7-diene, <i>syn</i> -)	20380-30-7	**	9.08 (V)	PE	4045
			**	9.08 (V)	PE	4258
	C_8H_8 (Tricyclo[4.2.0.0 ^{2,5}]octa-3,7-diene, <i>anti</i> -)	20380-31-8	**	8.90 (V)	PE	4258
			**	8.96 (V)	PE	4045
	$C_6H_5CH_2CH_2C_6H_4CH_3$ (Benzene, 1-methyl-2-(2-phenylethyl)-)	34403-05-9		10.0 ± 0.2	EI	5230
	$C_6H_5CH_2CH_2C_6H_4CH_3$ (Benzene, 1-methyl-3-(2-phenylethyl)-)	34403-06-0		10.1 ± 0.2	EI	5230
	$C_6H_5CH_2CH_2C_6H_4CH_3$ (Benzene, 1-methyl-4-(2-phenylethyl)-)	14310-20-4		10.6 ± 0.5	EI	5230
	$C_6H_5CH_2CH_2CH_2C_6H_5$ (Benzene, 1,1'-(1,3-propanediyl)bis-)	1081-75-0		10.0 ± 0.2	EI	5230
	$C_6H_5CH_2CH_2C_7H_7$ (1,3,5-Cycloheptatriene, 7-(2-phenylethyl)-)	712-32-6		9.3 ± 0.2	EI	5230
	$C_{10}H_{11}OH$ (2-Naphthalenol, 1,2,3,4-tetrahydro-)	530-91-6	C_2H_4O	11.68 ± 0.04	EI	4960
	$C_6H_5CH_2CH_2OCOCH_3$ (Acetic acid, 2-phenylethyl ester)	103-45-7		8.90	EI	3590
$C_8H_9^+$	$C_6H_5(CH_3)_2$ (Benzene, 1-2-dimethyl-)	95-47-6	H	12.10 ± 0.2	EI	4199
	$C_6H_5(CH_3)_2$ (Benzene, 1,3-dimethyl-)	108-38-8	H	12.25 ± 0.2	EI	4199
	$C_6H_5(CH_3)_2$ (Benzene, 1,4-dimethyl-)	106-42-3	H	12.10 ± 0.2	EI	4199
	$C_6H_5C_2H_5$ (Benzene, ethyl-)	100-41-4	H	10.60	EI	5293
	$C_6H_5CH(CH_3)_2$ (Benzene, 1-methylethyl-)	98-82-8	CH_3	10.02	EI	5293
	$C_6H_5CH_2CH_2CH_3$ (Benzene, propyl-)	103-65-1	CH_3	9.98	EI	5293
	$C_6H_5C_4H_9$ (Benzene, butyl-)	104-51-8	C_2H_5	9.98	EI	5293
	$C_6H_5CH(CH_3)C_2H_5$ (Benzene, 1-methylpropyl)	135-98-8	C_2H_5	9.93	EI	5293
	$C_6H_5(CH_3)C_4H_9$ (Benzene, 1-butyl-3-methyl-)	1595-04-6		11.43 ± 0.1	EI	3629
	$C_6H_5(CH_3)C_4H_9$ (Benzene, 1-butyl-4-methyl-)	1595-05-7		11.03 ± 0.1	EI	3629
	$C_6H_5CH_2CH_2C_6H_4CH_3$ (Benzene, 1-methyl-2-(2-phenylethyl)-)	34403-05-9		10.15 ± 0.1	EI	5230
	$C_6H_5CH_2CH_2C_6H_4CH_3$ (Benzene, 1-methyl-3-(2-phenylethyl)-)	34403-06-0		10.35 ± 0.1	EI	5230
	$C_6H_5CH_2CH_2C_6H_4CH_3$ (Benzene, 1-methyl-4-(2-phenylethyl)-)	14310-20-4		10.0 ± 0.1	EI	5230
	$C_6H_5CH_2CH_2CH_2C_6H_5$ (Benzene, 1,1'-(1,3-propanediyl)bis-)	1081-75-0		10.4 ± 0.2	EI	5230
	$C_6H_5CH_2CH_2C_7H_7$ (1,3,5-Cycloheptatriene, 7-(2-phenylethyl)-)	712-32-6		8.95 ± 0.05	EI	5230

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_8H_9^+$	$CH_3C_6H_4CH_2N(CH_3)_2$ (Benzenemethanamine, N,N, <i>ar</i> -trimethyl-)	56927-89-0	C_2H_6N	10.92	PI	5543
	$C_6H_5(CH_3)CH_2CH_2OCOCH_3$ (Phenethyl alcohol, <i>m</i> -methyl-, acetate)	33709-40-9		12.30	EI	3590
	$C_6H_4(CH_3)CH_2CH_2OCOCH_3$ (Phenethyl alcohol, <i>p</i> -methyl-, acetate)	22532-47-4		11.80	EI	3590
$C_8H_{10}^+$	$C_7H_7(CH_3)$ (Tricyclo[4.1.0.0 ^{2,7}]hept-3-ene, 1-methyl-)	61772-33-6	**	8.45 (V)	PE	5441
	$C_7H_7(CH_3)$ (Tricyclo[4.1.0.0 ^{2,7}]hept-3-ene, 6-methyl-)	61772-31-4	**	8.64 (V)	PE	5441
	$(C_2H_5C\equiv C)_2$	16387-70-5	**	8.78	PE	4731
	<i>trans</i> -1,3,5,7- C_8H_{10}	3725-31-3	**	7.79 ± 0.02	PE	4846
	$C_6H_4(CH_3)_2$ (Benzene, 1,2-dimethyl-)	95-47-6	**	8.45 ± 0.02	PE	3854
			**	8.57 ± 0.03 (V)	PE	4828
			**	8.57 (V)	PE	4063
			**	8.75 ± 0.03 (V)	PE	3713
			**	8.55 ± 0.1	EI	3788
			**	8.85 ± 0.05	EI	4199
			**	8.61	CTS	3546
			**	8.70	CTS	4029
	$C_6H_4(CH_3)_2$ (Benzene, 1,3-dimethyl-)	108-38-3	**	8.50 ± 0.02	PE	3854
			**	8.55 (V)	PE	4231
			**	8.71 ± 0.015 (V)	PE	4107
			**	8.75 ± 0.03 (V)	PE	3713
	$C_6H_4(CH_3)_2$ (Benzene, 1,3-dimethyl-)	108-38-8	**	8.90 ± 0.05	EI	4199
	$C_6H_4(CH_3)_2$ (Benzene, 1,4-dimethyl-)	106-42-3	**	8.37 ± 0.02	PE	3854
			**	8.43 (V)	PE	4231
			**	8.44	PE	5574
			**	8.6 ± 0.03 (V)	PE	3713
			**	8.80 ± 0.05	EI	4199
	$C_6H_5-C_2H_5$ (Benzene, ethyl-)	100-41-4	**	8.76	EI	5293
	C_8H_{10} (Bicyclo[2.2.1]hept-2-ene, 5-methylene-)	694-91-7	**	8.93 (V)	PE	3824
			**	9.01 (V)	PE	4249
	C_8H_{10} (Bicyclo[4.1.1]octa-2,4-diene)	61885-53-8	**	8.11 (V)	PE	4723
	$C_6H_6(=CH_2)_2$ (Cyclohexene, 4,5-bis(methylene)-)	54290-41-4	**	9.00 (V)	PE	4249
	$CH\equiv CC_6H_5$ (Cyclohexene, 1-ethynyl-)	931-49-7	**	8.61 ± 0.01	PE	5407
	C_8H_{10} (1,3,5-Cyclooctatriene)	1871-52-9	**	7.9	PE	3999
	C_8H_{10} (1,3,6-Cyclooctatriene)	3725-30-2	**	8.5	PE	3999
	C_8H_{10} (1-Cycloocten-5-yne)	68177-00-4	**	8.90	PE	5053
	$C_7H_4=C(CH_3)_2$ (1,3-Cyclopentadiene, 5-(1-methylethylidene)-)	2175-91-9	**	8.03 (V)	PE	4357
	C_8H_{10} (Dicyclopropa[<i>cd,gh</i>]pentalene, octahydro-)	765-72-0	**	9.12 ± 0.02 (V)	PE	4338
	C_8H_{10} (Spiro[2.5]octa-4,6-diene)	53143-64-9	**	7.89 (V)	PE	5359
	C_8H_{10} (Spiro[3.4]octa-5,7-diene)	15439-15-3	**	8.20	PE	4268

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_8H_{10}^+$	C_8H_{10} (Tricyclo[3.2.1.0 ^{2,4}]oct-6-ene, (1 α ,2 α ,4 α ,5 α)-)	3635-94-7	**	9.05 (V)	PE	3509
	C_8H_{10} (Tricyclo[3.2.1.0 ^{2,4}]oct-6-ene, (1 α ,2 β ,4 β ,5 α)-)	3635-95-8	**	8.90 (V)	PE	3509
	C_8H_{10} (Tricyclo[3.2.1.0 ^{2,8}]oct-6-ene)	XXXXX-XX-X	**	8.5 (V)	PE	4034
	C_8H_{10} (Tricyclo[3.3.0.0 ^{2,6}]octene)	53754-35-1	**	8.63 (V)	PE	4259
	C_8H_{10} (Tricyclo[4.2.0.0 ^{2,5}]oct-3-ene, (1 α ,2 β ,5 β ,6 α)-)	39781-76-5	**	9.25 (V)	PE	4045
	$C_6H_4(CH_3)C_4H_9$ (Benzene, 1-butyl-3-methyl-)	1595-04-6	$CH_2=CHCH_3$	10.33 ± 0.1	EI	3629
	$C_6H_4(CH_3)C_4H_9$ (Benzene, 1-butyl-4-methyl-)	1595-05-7	$CH_2=CHCH_3$	10.14 ± 0.1	EI	3629
	$CH_3C_6H_4CH_2N(CH_3)_2$ (Benzenemethanamine,N,N, <i>ar</i> -trimethyl-)	56927-89-0	C_2H_5N	9.6	PI	5543
	$(C_6H_4(CH_3)_2(CO)_3)Cr$ (Chromium, tricarbonyl[(1,2,3,4,5,6- η)-1,2-dimethylbenzene]-)	12129-29-2		8.51 ± 0.1	EI	3788
$C_8H_{11}^+$	$C_{10}H_{15}C_2H_5$ (4,7-Methano-1 <i>H</i> -indene, 5-ethyloctahydro-, (3 α ,4 β ,5 α ,7 β ,7 α)-)	32787-97-6		9.9 ± 0.1	PI	3918
$C_8H_{12}^+$	$((CH_3)_2C=C)_2$	2431-31-4	**	7.70	PE	5034
	$(C_2H_5)_2C=CHC\equiv CH$	2750-71-2	**	8.54 ± 0.01	PE	5407
	$CH_3CH=CHCH=CHCH=CHCH_3$ -E,E,E	15192-80-0		7.95 (V)	PE	4380
	$(CH_3)_2C=CHCH=CHCH=CH_2$ -E,E	16895-46-8		7.88 (V)	PE	4380
	$C_3H_7C\equiv CC(CH_3)=CH_2$	17669-40-8	**	8.62 ± 0.01	PE	5407
	$C_4H_9C\equiv CCH=CH_2$	17679-92-4	**	8.83 ± 0.01	PE	5407
	$CH_3CH=C(CH_3)CH=CHCH=CH_2$ -E,E	58434-77-8		8.01 (V)	PE	4380
	<i>cis</i> - $CH\equiv CCH=CH(CH_2)_3CH_3$	42091-89-4	**	8.91 ± 0.01	PE	5407
	<i>cis</i> - $CH_3C\equiv CC(C_2H_5)=CHCH_3$	70058-02-5	**	8.28 ± 0.01	PE	5407
	<i>trans</i> - $CH\equiv CCH=CH(CH_2)_3CH_3$	42104-42-7	**	8.87 ± 0.01	PE	5407
	<i>trans</i> - $CH_3C\equiv CC(C_2H_5)=CHCH_3$	70058-03-6	**	8.23 ± 0.01	PE	5407
	C_8H_{12}	497-35-8	**	9.02 (V)	PE	3824
	C_8H_{12} (Bicyclo[2.2.1]heptane, 2-methylene-)		**	9.04 (V)	PE	4249
	C_8H_{12} (Bicyclo[2.2.1]heptane, 7-methylene-)	31463-35-1	**	9.40 (V)	PE	3933
	C_8H_{12} (Bicyclo[2.2.2]oct-2-ene)	931-64-6	**	9.03 (V)	PE	4285
			**	9.05 ± 0.02 (V)	PE	4842
			**	9.07 (V)	PE	4249
	C_8H_{12}	61885-54-9	**	8.90 (V)	PE	4723
	C_8H_{12} (Bicyclo[4.1.1]oct-3-ene)					
	$C_4H_3(CH_3)_2C\equiv CH$ (Cyclobutane,3-ethynyl-1,1-dimethyl)	66438-88-8	**	9.78 (V)	PE	5607
	$C_6H_8(=CH_2)_2$ (Cyclohexane,1,2-bis(methylene)-)	2819-48-9	**	8.90	PE	5265
			**	8.92 (V)	PE	4249
	$C_6H_{10}=C=CH_2$ (Cyclohexane,ethenylidene-)	5664-20-0	**	8.69	PE	5625
	$C_6H_{11}C\equiv CH$ (Cyclohexane, ethynyl-)	931-48-6	**	9.92 (V)	PE	3997
	C_8H_{12} (1,5-Cyclooctadiene-(E,Z)-)	5259-71-2	**	8.7 (V)	PE	5372
	C_8H_{12} (1,3-Cyclooctadiene)	1700-10-3	**	8.4	PE	3999
	C_8H_{12} (1,4-Cyclooctadiene)	1073-07-0	**	8.5	PE	3999

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_8H_{12}^+$	C_8H_{12} (1,5-Cyclooctadiene)	111-78-4	**	8.9	PE	3999
	C_8H_{12} (Cyclooctyne)	1781-78-8	**	8.9	PE	4180
	$CH_2=CHCH_2C_5H_7$ (Cyclopentene, 1-(2-propenyl)-)	37689-19-3	**	9.10 (V)	PE	4362
	$CH_2=CHCH_2C_5H_7$ (Cyclopentene, 3-(2-propenyl)-)	14564-97-7	**	8.89±0.02	PI	5556
	$C_3H_3CH_3(CH=C=CHCH_3)$ (Cyclopropane, 1-(1,2-butadienyl)-2-methyl- <i>cis</i> -)	60166-71-4	**	8.96	PE	4608
	$C_3H_3CH=CHC_3H_5$ (Cyclopropane, 1,1'-(1,2-ethenediyl)bis- (<i>E</i>))	10359-44-1	**	7.72	PI	3759
	$C_3H_3CH=CHC_3H_5$ (Cyclopropane, 1,1'-(1,2-ethenediyl)bis- (<i>Z</i>))	23510-65-6	**	7.70	PI	3759
	$(C_3H_5)_2C=CH_2$ (Cyclopropane, 1,1'-ethenylidenebis-)	822-93-5	**	8.08	PI	3759
	$C_3H_3CH=C=C(CH_3)_2$ (Cyclopropane, (3-methyl-1,2-butadienyl)-)	60166-72-5	**	8.87	PE	4608
	C_8H_{12} (Cyclopropane, 1-methyl-1-(1-methyl-1,2-propadienyl)-)	60166-69-0	**	8.81	PE	4608
	C_8H_{12} (Dispiro[2.0.2.2]octane)	21426-37-9	**	9.02 (V)	PE	5361
	C_8H_{12} (Dispiro[2.1.2.1]octane)	25399-32-0	**	9.21 (V)	PE	5361
	C_8H_{12} (Spiro[2.5]oct-4-ene)	7647-57-6	**	8.44 (V)	PE	5359
	C_8H_{12} (Spiro[3.4]oct-5-ene)	14783-50-7	**	8.65	PE	4268
	$C_7H_9CH_3$ (Tricyclo[4.1.0.0 ^{2,7}]heptane, 1-methyl-)	32348-63-3	**	8.89 (V)	PE	4347
	$C_7H_9CH_3$ (Tricyclo[4.1.0.0 ^{2,7}]heptane, 2-methyl-)	40391-49-9	**	8.20 (V)	PE	5441
	C_8H_{12} (Tricyclo[3.2.1.0 ^{2,4}]octane, (1 α ,2 α ,4 α ,5 α)-)	22389-16-8	**	8.42 (V)	PE	5441
	C_8H_{12} (Tricyclo[3.2.1.0 ^{2,4}]octane, (1 α ,2 β ,4 β ,5 α)-)	13377-46-3	**	9.40 (V)	PE	3509
	C_8H_{12} (Tricyclo[3.3.0.0 ^{2,6}]octane)	250-21-5	**	8.8±0.1	EI	3492
	C_8H_{12} (Tricyclo[4.2.0.0 ^{2,5}]octane, <i>syn</i> -)	28636-10-4	**	9.40 (V)	PE	3509
	C_8H_{12} (Tricyclo[4.2.0.0 ^{2,5}]octane, <i>anti</i> -)	13027-75-3	**	9.1±0.1	EI	3492
	C_8H_{12} (Tricyclo[5.1.0.0 ^{2,4}]octane, (1 α ,2 α ,4 α ,7 α)-)	50695-42-6	**	9.78 (V)	PE	4259
	C_8H_{12} (Tricyclo[5.1.0.0 ^{2,4}]octane, (1 α ,2 β ,4 β ,7 α)-)	50895-58-4	**	9.18 (V)	PE	4045
	$C_{10}H_{16}$ (4,7-Methano-1 <i>H</i> -indene, octahydro-, (3 α ,4 β ,7 β ,7 α)-)	2825-82-3	**	9.23 (V)	PE	4045
	$C_{10}H_{15}CH_3$	XXXXX-XX-X	**	8.95 (V)	PE	3849
	$C_{10}H_{15}CH_3$ (4,7-Methano-1 <i>H</i> -indene, octahydro-2-methyl, (2 α ,3 $\alpha\beta$,4 α ,7 α ,7 $\alpha\beta$)-)	50745-90-9	**	9.39 (V)	PE	3849
	$C_{10}H_{15}CH_3$ (4,7-Methano-1 <i>H</i> -indene, octahydro-8-methyl-, stereoisomer)	50745-92-1	**	10.5±0.1	PI	3918
	$C_{10}H_{15}CH_3$	XXXXX-XX-X	**	10.0±0.1	PI	3918
$C_8H_{13}^+$	$C_{10}H_{15}CH_3$ (4,7-Methano-1 <i>H</i> -indene, octahydro-2-methyl, (2 α ,3 $\alpha\beta$,4 α ,7 α ,7 $\alpha\beta$)-)	50745-90-9	**	10.1±0.1	PI	3918
	$C_{10}H_{15}CH_3$ (4,7-Methano-1 <i>H</i> -indene, octahydro-8-methyl-, stereoisomer)	50745-92-1	**	9.5±0.1	PI	3918

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_8H_{14}^+$	$C_5H_7((CH_2)_2CH_3)$ (Cyclopentene, 3-(1-methylethyl)-)	4276-45-3	**	8.85 ± 0.05 (V)	PE	4954
			**	8.81 ± 0.02	PI	5556
	$(tert-C_4H_9)CH_2C \equiv CH_3$	56617-18-6	**	9.284 ± 0.007	PE	4575
	$(CH_3)_2C = CHCH = C(CH_3)_2$	764-13-6	**	7.65	PE	3847
	$(CH_3)_2CHC \equiv CCH(CH_3)_2$	927-99-1	**	9.171 ± 0.008	PE	4575
	$C_3H_7C \equiv CC_3H_7$	1942-45-6	**	9.196 ± 0.005	PE	4575
			**	9.20 ± 0.02	PI	5583
	$C_5H_{11}C \equiv CCH_3$	2809-67-8	**	9.302 ± 0.005	PE	4575
			**	9.31 ± 0.02	PI	5583
	$CH_2 = CH(CH_3)_4CH = CH_2$	3710-30-3	**	9.52 ± 0.02 (V)	PE	4010
	$C_2H_5C \equiv CC_4H_9$	15232-76-5	**	9.222 ± 0.005	PE	4575
			**	9.22 ± 0.02	PI	5583
	1- C_8H_{14}	629-05-0	**	9.95 ± 0.02	PI	5583
	$(tert-C_4H_9)C \equiv CC_2H_5$	4911-60-8	**	9.180 ± 0.010	PE	4575
	C_8H_{14}	280-33-1	**	9.43	S	3757
	(Bicyclo[2.2.2]octane)		**	9.45 ± 0.02	PE	3757
	C_8H_{14}	7078-34-4	**	10.0 (V)	PE	4723
	(Bicyclo[4.1.1]octane)		**			
	$C_3H_7(CH_3)_2CH = CH_2$	52708-22-2	**	9.40 (V)	PE	4347
	(Cyclobutane, 3-ethenyl-1,1-dimethyl-)		**	9.40 (V)	PE	5607
	$C_6H_{11}CH = CH_2$	695-12-5	**	9.51	PE	4347
	(Cyclohexane, ethenyl-)		**			
	$C_2H_5C_6H_9$	1453-24-3	**	8.48 ± 0.01	PI	5556
	(Cyclohexene, 1-ethyl-)		**			
	$C_2H_5C_6H_9$	2808-71-1	**	8.83 ± 0.01	PI	5556
	(Cyclohexene, 3-ethyl-)		**			
	$C_2H_5C_6H_9$	3742-42-5	**	8.88 ± 0.01	PI	5556
	(Cyclohexene, 4-ethyl-)		**			
	C_8H_{14}	931-88-4	**	8.8	PE	3999
	(Cyclooctene)		**			
	$n-C_8H_7-C_5H_7$	3074-61-1	**	9.02 (V)	PE	4285
	(Cyclopentene, 1-propyl)		**	8.48 ± 0.01	PI	5556
	$n-C_8H_7-C_5H_7$	34067-75-9	**	8.84 ± 0.02	PI	5556
	(Cyclopentene, 3-propyl-)		**			
	C_8H_{14}	185-65-9	**	9.46 (V)	PE	5359
	(Spiro[2.5]octane)		**			
	C_8H_{14}	175-56-4	**	9.45	PE	4268
	(Spiro[3.4]octane)		**			
$C_8H_{16}^+$	$(CH_3)_3CCH_2C(CH_3) = CH_2$	107-39-1	**	8.909 ± 0.005	PE	3957
	$(CH_3)_2CHC(CH_3) = C(CH_3)_2$	565-77-5	**	8.165 ± 0.005	PE	3957
	$C_2H_5CH_2C(CH_3) = C(CH_3)_2$	7145-20-2	**	8.186 ± 0.005	PE	3957
	$(C_2H_5)_2C = CHC_2H_5$	16789-51-8	**	8.480 ± 0.004	PE	3957
	$(C_2H_5)_2C = C(CH_3)_2$	19780-67-7	**	8.170 ± 0.003	PE	3957
	1- C_8H_{16}	111-66-0	**	9.427 ± 0.006	PI	5584
			**	9.60 ± 0.01 (V)	PE	4939
	<i>cis</i> -(CH_3) ₂ CHCH = CHCH(CH_3) ₂	10557-44-5	**	8.846 ± 0.005	PE	3957
	<i>cis</i> - $C_2H_5C(CH_3) = C(CH_3)C_2H_5$	19550-87-9	**	8.172 ± 0.003	PE	3957
	<i>cis</i> -2- C_8H_{16}	7642-04-8	**	8.913 ± 0.009	PI	5584
			**	9.10 ± 0.01 (V)	PE	4939
	<i>cis</i> -3- C_8H_{16}	14850-22-7	**	8.859 ± 0.008	PI	5584
			**	8.849 ± 0.005	PE	3957
			**	9.05 ± 0.01 (V)	PE	4939
	<i>cis</i> -4- C_8H_{16}	7642-15-1	**	8.836 ± 0.006	PI	5584
			**	8.841 ± 0.005	PE	3957
			**	9.03 ± 0.01 (V)	PE	4939

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₈H₁₆⁺	<i>trans</i> -(CH ₃) ₂ CHCH=CHCH(CH ₃) ₂	692-70-6	**	8.838±0.005	PE	3957
	<i>trans</i> -C ₂ H ₅ C(CH ₃)=C(CH ₃)C ₂ H ₅	19550-88-0	**	8.156±0.003	PE	3957
	<i>trans</i> -2-C ₈ H ₁₆	13389-42-9	**	8.913±0.006	PI	5584
			**	9.09±0.01 (V)	PE	4939
	<i>trans</i> -3-C ₈ H ₁₆	14919-01-8	**	8.854±0.006	PI	5584
			**	9.03±0.01 (V)	PE	4939
	<i>trans</i> -4-C ₈ H ₁₆	14850-23-8	**	8.836±0.006	PI	5584
			**	8.830±0.005	PE	3957
			**	9.01±0.01 (V)	PE	4939
	C ₆ H ₁₀ (CH ₃) ₂ (Cyclohexane, 1,2-dimethyl-, <i>cis</i> -)	2207-01-4	**	9.90±0.07	EI	3581
	C ₆ H ₁₀ (CH ₃) ₂ (Cyclohexane, 1,2-dimethyl-, <i>trans</i> -)	6876-23-9	**	10.03±0.05	EI	3581
	C ₂ H ₅ C ₆ H ₁₁ (Cyclohexane, ethyl-)	1678-91-7	**	9.67±0.02	PI	5556
	C ₈ H ₁₆ (Cyclooctane)	292-64-8	**	9.7	PE	3999
			**	9.80	PE	4319
			**	10.08±0.05	EI	4319
	<i>n</i> -C ₃ H ₇ C ₅ H ₉ (Cyclopentane, propyl-)	2040-96-2	**	10.00±0.04	PI	5556
C₆H₇⁺	C ₆ H ₅ C≡CCH ₃ (Benzene, 1-propynyl-)	673-32-5		11.42±0.05	EI	4044
	C ₆ H ₈ (1 <i>H</i> -Indene)	95-13-6	H	12.62±0.05	EI	4044
	C ₆ H ₈ (C ₆ H ₅) ₂ (Benzene, 1,1'-(2-cyclohexen-1-ylidene)bis-)	31158-25-5		13.6±0.4	EI	4018
	C ₆ H ₁₀ (C ₆ H ₅) ₂ (Benzene, 1,1'-cyclohexylidenebis-)	21113-55-3		13.3±0.4	EI	4018
	C ₆ H ₉ (CH ₃)(C ₆ H ₅) ₂ (Benzene, 1,1'-(4-methylcyclohexylidene)bis-)	32812-65-0		13.7±0.4	EI	4018
	C ₁₀ H ₁₃ (CH ₃)(C ₆ H ₅) ₂ (Naphthalene, 1,2,3,4,4a,5,6,7-octahydro-4a-methyl-2,2-diphenyl-)	50592-50-2		13.2±0.4	EI	4018
	C ₆ H ₅ C≡CCH=CHCH ₂ OH (2-Penten-4-yn-1-ol, 5-phenyl-, (<i>E</i>)-)	40317-08-6		11.43±0.05	EI	4044
	C ₆ H ₈ (=O)(C ₆ H ₅) ₂ (Cyclohexanone, 2,2-diphenyl-)	22612-62-0		14.1±0.4	EI	4018
	C ₆ H ₈ (=O)(C ₆ H ₅) ₂ (Cyclohexanone, 4,4-diphenyl-)	4528-68-1		13.5±0.4	EI	4018
	C ₆ H ₇ (=O)(CH ₃)(C ₆ H ₅) ₂ (Cyclohexanone, 2-methyl-5,5-diphenyl-)	50592-49-9		13.5±0.4	EI	4018
	C ₆ H ₇ (=O)(CH ₃)(C ₆ H ₅) ₂ (Cyclohexanone, 6-methyl-2,2-diphenyl-)	50592-52-4		13.7±0.4	EI	4018
	C ₆ H ₈ (OH)(CH ₃)(C ₆ H ₅) ₂ (Cyclohexanol, 1-methyl-4,4-diphenyl-)	50592-47-7		13.7±0.4	EI	4018
	C ₆ H ₉ (=O)(CH ₃) ₂ (C ₆ H ₅) ₂ (Cyclohexanone, 2,2-dimethyl-6,6-diphenyl-)	50592-53-5		13.8±0.4	EI	4018
	C ₁₀ H ₁₁ (=O)(CH ₃)(C ₆ H ₅) ₂ (2(3 <i>H</i>)-Naphthalenone, 4,4a,5,6,7,8-hexahydro-4a-methyl-7,7-diphenyl-)	50786-03-3		13.0±0.4	EI	4018
	C ₆ H ₈ (=O)(CH ₃)(C ₆ H ₅) ₂ CH ₂ CH ₂ CHO (Cyclohexanepropional, 1-methyl-2-oxo-3,3-diphenyl-)	XXXXX-XX-X		13.4±0.4	EI	4018
	C ₆ H ₉ (=O)(CH ₃)(C ₆ H ₅) ₂ CH ₂ CH ₂ COCH ₃ 4018	50592-55-7		14.2±0.4	EI	4018
	(Cyclohexanone, 2-methyl-2-(3-oxobutyl)-6,6-diphenyl-)					
	C ₆ H ₉ (=O)(C ₆ H ₅) ₂ =CHS(CH ₂) ₃ CH ₃ (Cyclohexanone, 6-[(butylthio)methylene]-2,2-diphenyl-)	50592-51-3		13.7±0.4	EI	4018
	C ₆ H ₉ (=O)CH ₃ (C ₆ H ₅) ₂ CH ₂ CH=C(CH ₃)Cl (Cyclohexanone, 2-(3-chloro-2-butenyl)-2-methyl-6,6-diphenyl-)	50592-54-6	Cl	13.7±0.4	EI	4018

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_9H_8^+$	$C_6H_5(CH)_2C\equiv CH$ (Benzene, 1-ethynyl-2-methyl-)	766-47-2	**	8.61 ± 0.02 (V)	PE	5409
	$C_6H_5(CH)_3C\equiv CH$ (Benzene, 1-ethynyl-3-methyl-)	766-82-5	**	8.63 ± 0.02 (V)	PE	5409
	$C_6H_5(CH)_4C\equiv CH$ (Benzene, 1-ethynyl-4-methyl-)	766-97-2	**	8.43 (V)	PE	4334
	$C_6H_5CH=CH=CH_2$ (Benzene, 1,2-propadienyl-)	2327-99-3	**	8.48 ± 0.02 (V)	PE	5409
	$C_6H_5CH=CH=CH_2$ (Benzene, 1,2-propadienyl-)	2327-99-3	**	8.29 (V)	PE	4493
	$C_6H_5C\equiv CCH_3$ (Benzene, 1-propynyl-)	673-32-5	**	8.41 ± 0.02 (V)	PE	5409
	$C_6H_5C_6H_5$ (1H-Indene)	95-13-6	**	8.49 (V)	PE	4334
	$C_6H_5C_6H_5$ (1H-Indene)	95-13-6	**	8.15 ± 0.015 (V)	PE	5522
	C_9H_8 (Spiro[4.4]nona-1,3,6,8-tetraene)	14867-83-5	**	8.33 ± 0.01	EI	3805
	C_9H_8 (Spiro[4.4]nona-1,3,6,8-tetraene)	14867-83-5	**	7.99 (V)	PE	4049
			**	7.99 (V)	PE	4189
$C_9H_9^+$	$CH\equiv C(CH=CH)_3CH_3$	1743-34-6	H	10.7 ± 0.1	EI	4336
	$C_6H_5C_3H_5$ (Benzene, cyclopropyl-)	873-49-4	H	11.4 ± 0.1	EI	4336
	$C_6H_5(CH_2)_3CH=CH_2$ (Benzene, 1-ethenyl-4-methyl-)	622-97-9	H	11.8 ± 0.1	EI	4336
	$C_6H_5C(CH_3)=CH_2$ (Benzene, (1-methylethenyl)-)	98-83-9	H	11.8 ± 0.1	EI	4336
	$C_6H_5CH=CHCH_3$ (Benzene, 1-propenyl-)	637-50-3	H	11.8 ± 0.1	EI	4336
	$C_6H_5CH_2CH=CH_2$ (Benzene, 2-propenyl-)	300-57-2	H	11.6 ± 0.1	EI	4336
	C_9H_{10} (1H-Indene, 2,3-dihydro-)	496-11-7	H	12.1 ± 0.1	EI	4336
$C_9H_{10}^+$	$CH\equiv C(CH=CH)_3CH_3$	1743-34-6	**	7.2 ± 0.1	EI	4336
	$C_6H_5C_3H_5$ (Benzene, cyclopropyl-)	873-49-4	**	8.61 (V)	PE	4927
			**	8.66 (V)	PE	4815
			**	8.71 (V)	PE	4347
			**	8.3 ± 0.1	EI	4336
	$C_6H_5(CH_2)_3CH=CH_2$ (Benzene, 1-ethenyl-2-methyl-)	611-15-4	**	8.20 ± 0.02	PE	3854
	$C_6H_5(CH_2)_3CH=CH_2$ (Benzene, 1-ethenyl-2-methyl-)	611-15-4	**	8.53 (V)	PE	3964
	$C_6H_5(CH_2)_3CH=CH_2$ (Benzene, 1-ethenyl-3-methyl-)	100-80-1	**	8.15 ± 0.02	PE	3854
	$C_6H_5(CH_2)_3CH=CH_2$ (Benzene, 1-ethenyl-3-methyl-)	100-80-1	**	8.37 (V)	PE	3964
	$C_6H_5(CH_2)_4CH=CH_2$ (Benzene, 1-ethenyl-4-methyl-)	622-97-9	**	8.20 (V)	PE	3964
	$C_6H_5C(CH_3)=CH_2$ (Benzene, (1-methylethenyl)-)	98-83-9	**	8.1 ± 0.1	EI	4336
	$C_6H_5C(CH_3)=CH_2$ (Benzene, (1-methylethenyl)-)	98-83-9	**	8.52 (V)	PE	3964
			**	8.18 ± 0.04	EI	4097
			**	8.3 ± 0.1	EI	4336
	$C_6H_5CH=CHCH_3$ (Benzene, 1-propenyl-, (E)-)	873-66-5	**	8.20 ± 0.02	PE	3854
			**	8.32	PE	4289
			**	7.84 ± 0.04	EI	4097
	$C_6H_5CH=CHCH_3$ (Benzene, 1-propenyl-, (Z)-)	766-90-5	**	8.45	PE	4289
	$C_6H_5CH=CHCH_3$ (Benzene, 1-propenyl-)	637-50-3	**	8.5 ± 0.1	EI	4336

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_9H_{10}^+$	$C_6H_5C(CH_3)=CH_2$ (Benzene, 2-propenyl-)	300-57-2	**	8.20 ± 0.02	PE	3854
			**	8.60	PE	3938
			**	9.16 (V)	PE	4211
			**	7.8 ± 0.1	EI	4336
	$C_7H_6(=CH_2)_2$ (Bicyclo[2.2.1]hept-2-ene, 5,6-bis(methylene)-)	5628-77-3	**	8.48 (V)	PE	4249
	C_9H_{10} (Bicyclo[3.2.2]nona-2,6,8-triene)	16216-91-4	**	8.72 (V)	PE	3991
	C_9H_{10} (1H-Cyclobuta[cd]pentalene, 1a,3a,5a,5b-tetrahydro-)	58913-91-0	**	8.76	PE	4855
	$C_8H_8=CH_2$ (Dicyclopropa[cd,gh]pentalene, octahydro-1-methylene-)	3721-64-0	**	8.43 ± 0.02 (V)	PE	4338
	C_9H_{10} (1H-Indene, 2,3-dihydro-)	496-11-7	**	8.45 ± 0.02 (V)	PE	3854
			**	8.46 (V)	PE	4063
			**	8.6 ± 0.1	EI	4336
			**	8.60 ± 0.01	EI	3805
			**	8.52	CTS	3546
			**	8.46 ± 0.03 (V)	PE	4828
			**	8.50	PE	4952
	C_9H_{10} (1,2-Methanodicyclopropa[cd,gh]pentalene, octahydro-)	13084-56-5	**	9.06 ± 0.02 (V)	PE	4338
			**	9.15 ± 0.05 (V)	PE	5335
	C_9H_{10} (Pentacyclo[4.3.0.0 ^{2,3} .0 ^{3,8} .0 ^{4,7}]nonane)	452-61-9	**	8.47	PE	4955
	C_9H_{10} (Spiro[bicyclo[2.2.1]hepta-2,5-diene-7,1'-cyclopropane])	7092-57-1	**	8.73 (V)	PE	3780
	C_9H_{10} (Spiro[4.4]nona-1,3,6-triene)	766-30-3	**	8.27 (V)	PE	4189
	C_9H_{10} (Spiro[4.4]nona-1,3,7-triene)	24430-29-3	**	8.25 (V)	PE	4189
	C_9H_{10} (Tricyclo[3.2.2.0 ^{2,4}]nona-6,8-diene)	7092-05-9	**	8.65 (V)	PE	5605
	C_9H_{10} (Tricyclo[3.3.1.0 ^{2,8}]nona-3,6-diene)	14693-11-9	**	8.4 (V)	PE	4034
	C_9H_{10} (Tricyclo[4.2.1.0 ^{2,5}]nona-3,7-diene)	4932-71-2	**	8.7 (V)	PE	3853
	C_9H_{10} (Tricyclo[4.2.1.0 ^{2,5}]nona-3,7-diene, (1 α ,2 α ,5 α ,6 α)-)	15564-45-1	**	9.03 ± 0.03 (V)	PE	4281
	C_9H_{10} (Tricyclo[4.2.1.0 ^{2,5}]nona-3,7-diene, (1 α ,2 β ,5 β ,6 α)-)	15564-44-0	**	8.65 ± 0.05 (V)	PE	4040
	$C_8H_8(=CH_2)$ (Tricyclo[3.2.1.0 ^{2,4}]oct-6-ene,8-methylene-)	XXXXX-XX-X	**	8.85 ± 0.05 (V)	PE	5335
	$C_6H_5(CH_2)_3NH_2$ (Benzenepropanamine)	2038-57-5	NH ₄	9.5 ± 0.1	EI	5374
	$C_6H_4(CH_3)CH_2CH_2OCOCH_3$ (Phenethyl alcohol, <i>m</i> -methyl-, acetate)	33709-40-9		8.75	EI	3590
	$C_6H_4(CH_3)CH_2CH_2OCOCH_3$ (Phenethyl alcohol, <i>p</i> -methyl-, acetate)	22532-47-4		8.50	EI	3590
$C_9H_{12}^+$	$C_6H_5(iso-C_3H_7)$ (Benzene, (1-methylethyl)-)	98-82-8	**	8.75 (V)	PE	4927
			**	8.72	EI	5293
			**	8.98 (V)	PE	4347
	$(C_2H_5)_3C$	20685-34-1	**	9.52 (V)	PE	3994
	$C_6H_5CH_2CH_2CH_3$ (Benzene, propyl-)	103-65-1	**	8.71	EI	5293
	$C_6H_5(CH_3)_3$ (Benzene, 1,2,3-trimethyl-)	526-73-8	**	8.6 ± 0.03 (V)	PE	3713

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_9H_{12}^+$	$C_9H_3(CH_3)_3$ (Benzene, 1,2,4-trimethyl-)	95-63-6	**	8.5 ± 0.03 (V)	PE	3713
	$C_9H_3(CH_3)_3$ (Benzene, 1,3,5-trimethyl-)	108-67-8	**	8.45 ± 0.05 (V)	PE	4132
			**	8.45 ± 0.05 (V)	PE	4724
			**	8.45 (V)	PE	5367
			**	8.65 ± 0.03 (V)	PE	3713
			**	8.21 ± 0.1	EI	3788
			**	8.46	CTS	4029
	$C_8H_8(=CH_2)_2$ (Bicyclo[2.2.1]heptane, 2,3-bis(methylene)-)	36439-78-8	**	8.41 (V)	PE	4249
	C_9H_{12} (Bicyclo[3.2.2]nona-2,6-diene)	14993-07-8	**	8.84 (V)	PE	3991
	C_9H_{12} (Bicyclo[3.2.2]nona-6,8-diene)	7164-08-1	**	9.00 (V)	PE	3991
	C_9H_{12} (Bicyclo[4.2.1]nona-2,4-diene)	6572-82-3	**	8.23 (V)	PE	4688
	$C_9H_{10}=CH_2$ (Bicyclo[2.2.2]oct-2-ene, 5-methylene-)	19386-05-1	**	8.97 (V)	PE	4249
	$CH \equiv CCH = C_6H_{10}$ (Cyclohexane,2-propynyldiene-)	2806-45-3	**	8.49 ± 0.01	PE	5407
	$(C_6H_5)_2C = C = CH_2$ (Cyclopropane, 1,1'-(1,2-propadienyldiene)bis-)	60166-70-3	**	8.62	PE	4608
	C_9H_{12} (Spiro[4.4]nona-1,3-diene)	766-29-0	**	8.10 (V)	PE	4189
			**	8.14	PE	4268
	C_9H_{12} (Tetracyclo[3.3.1.0 ^{2,8} .0 ^{4,6}]nonane)	3105-29-1	**	8.67 (V)	PE	3741
	C_9H_{12} (Tetracyclo[6.1.0.0 ^{2,4} .0 ^{5,7}]nonane(1 α ,2 α ,4 α ,5 β ,7 β ,8 α)-)	37831-90-6	**	9.0 (V)	PE	5192
	$C_7H_6(CH_3)_2$ (Tricyclo[4.1.0.0 ^{2,7}]hept-3-ene,1,3-dimethyl-)	66036-92-8	**	8.26 (V)	PE	5441
	$C_7H_6(CH_3)_2$ (Tricyclo[4.1.0.0 ^{2,7}]hept-3-ene,1,6-dimethyl-)	61772-32-5	**	8.30 (V)	PE	5441
	C_9H_{12} (Tricyclo[3.2.2.0 ^{2,1}]non-6-ene)	7092-58-2	**	8.8 (V)	PE	5605
	C_9H_{12} (Tricyclo[4.2.1.0 ^{2,5}]non-3-ene)	7078-40-2	**	9 (V)	PE	3853
	C_9H_{12} (Tricyclo[4.2.1.0 ^{2,5}]non-3-ene, (1 α ,2 β ,5 β ,6 α)-)	16529-76-3	**	9.00 ± 0.05 (V)	PE	4040
	C_9H_{12} (Tricyclo[4.2.1.0 ^{2,5}]non-7-ene)	6827-30-1	**	8.7 (V)	PE	3853
	C_9H_{12} (Tricyclo[4.2.1.0 ^{2,5}]non-7-ene, (1 α ,2 α ,5 α ,6 α)-)	16529-83-2	**	8.92 ± 0.03 (V)	PE	4281
	C_9H_{12} (Tricyclo[4.2.1.0 ^{2,5}]non-7-ene, <i>exo</i> -)	16529-82-1	**	8.70 ± 0.05 (V)	PE	4040
	C_9H_{12} (Tricyclo[6.1.0.0 ^{2,1}]non-5-ene(1 α ,2 α ,4 α ,8 α)-)	62211-27-2	**	8.90 (V)	PE	4964
	C_9H_{12} (Tricyclo[6.1.0.0 ^{2,1}]non-5-ene(1 α ,2 β ,4 β ,8 α)-)	62279-39-4	**	8.96 (V)	PE	4964
	C_9H_{12} (Tricyclo[6.1.0.0 ^{1,5}]non-6-ene(1 α ,3 α ,5 α ,8 α)-)	XXXXX-XX-X	**	9.0 (V)	PE	4964
	C_9H_{12} (Tricyclo[6.1.0.0 ^{1,5}]non-6-ene(1 α ,3 β ,5 β ,8 α)-)	62163-62-6	**	8.5 (V)	PE	4964
	$C_9H_{10}(=CH_2)$ (Tricyclo[3.2.1.0 ^{2,1}]octane,8-methylene-)	38310-48-4	**	9.10 ± 0.05 (V)	PE	5335
	C_9H_{12} (Trispiro[2.0.2.0.2.0]nonane)	31561-59-8	**	9.12 (V)	PE	4963
	$(C_6H_5)_3(CO)_3Cr$ (Chromium, tricarbonyl[(1,2,3,4,5,6- η)-1,3,5-trimethylbenzene]-)	12129-67-8		8.61 ± 0.1	EI	3788

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_9H_{13}^+$	$C(CH_3)(CH_2)C_6H_8CH_3$ (Cyclohexene, 1-methyl-4-(1-methylethenyl)-)	138-86-3	CH_3	8.9	El	5200
	$C_{10}H_{16}$ (4,7-Methano-1 <i>H</i> -indene, octahydro-, (3 α ,4 β ,7 β ,7 α)-)	2825-82-3	CH_3	9.8 ± 0.1	PI	3918
	$C_{10}H_{15}CH_3$	XXXXX-XX-X		$\leq 10.2 \pm 0.1$	PI	3918
	$C_{10}H_{15}CH_3$ (4,7-Methano-1 <i>H</i> -indene, octahydro-2-methyl-, (2 α ,3 α β ,4 α ,7 α ,7 α β)-)	50745-90-9		10.1 ± 0.1	PI	3918
	$C_{10}H_{15}CH_3$ (4,7-Methano-1 <i>H</i> -indene, octahydro-8-methyl-, stereoisomer)	50745-92-1		9.5 ± 0.1	PI	3918
	$C_{10}H_{15}C_2H_5$ (4,7-Methano-1 <i>H</i> -indene, 5-ethyloctahydro-, (3 α ,4 β ,5 α ,7 β ,7 α)-)	32787-97-6		9.9 ± 0.1	PI	3918
$C_9H_{14}^+$	$C_4H_9C \equiv CC(CH_3) = CH_2$	17603-76-8	**	8.57 ± 0.01	PE	5407
	$CH_3C \equiv CCH = C(C_2H_5)_2$	70058-01-4	**	8.12 ± 0.01	PE	5407
	$CH \equiv CC(iso-C_3H_7) = C(CH_3)_2$	61786-07-0	**	8.26 ± 0.01	PE	5407
	<i>cis</i> - $CH_3C \equiv CCH = CHC_4H_9$	53497-78-2	**	8.46 ± 0.01	PE	5407
	<i>trans</i> - $CH_3C \equiv CCH = CHC_4H_9$	53497-79-3	**	8.46 ± 0.01	PE	5407
	C_9H_{14} (Bicyclo[3.2.2]non-2-ene)	40319-81-1	**	8.84 (V)	PE	3991
	C_9H_{14} (Bicyclo[3.2.2]non-6-ene)	7124-86-9	**	8.95 (V)	PE	3991
	C_9H_{14} (Bicyclo[3.3.1]non-1-ene)	17530-61-9	**	8.35 (V)	PE	4569
	$C_8H_{12} = CH_2$ (Bicyclo[2.2.2]octane, 2-methylene-)	2972-20-5	**	8.87 (V)	PE	4249
	$CH_2 = CHCH_2C_6H_9$ (Cyclohexene, 1-(2-propenyl)-)	13511-13-2	**	8.49 ± 0.01	PI	5556
	$CH_2 = CHCH_2C_6H_9$ (Cyclohexene, 3-(2-propenyl)-)	15232-95-8	**	8.83 ± 0.02	PI	5556
	C_9H_{14} (1,2-Cyclononadiene)	1123-11-1	**	8.87 (V)	PE	4019
	$C_3H_2(CH_3)_2 = C = C(CH_3)_2$ (Cyclopropane, 1,1-dimethyl-2-(2-methyl-1-propenylidene)-)	28438-32-6	**	7.65	PE	5625
	$C_3H_2(CH_3)_2 = C = C(CH_3)_2$ (Cyclopropane, 1,2-dimethyl-3-(2-methyl-1-propenylidene)- <i>cis</i> -)	37817-36-0	**	7.76	PE	5625
	$C_3H_2(CH_3)_2 = C = C(CH_3)_2$ (Cyclopropane, 1,2-dimethyl-3-(2-methyl-1-propenylidene)- <i>trans</i> -)	37817-46-2	**	7.70	PE	5625
	$C_4H_5C(C_2H_5) = C = CHCH_3$ (Cyclopropane, (1-ethyl-1,2-butadienyl)-)	60042-77-5	**	8.60	PE	4608
	C_9H_{14} (Spiro[bicyclo[2.2.1]heptane-2,1'-cyclopropane])	173-89-7	**	9.45 (V)	PE	4433
	C_9H_{14} (Spiro[4.4]non-1-ene)	873-12-1	**	8.73	PE	4268
			**	8.96 (V)	PE	4347
	C_9H_{14} (Tricyclo[3.2.2.0 ^{2,4}]nonane)	278-80-8	**	9.3 (V)	PE	5605
			**	9.50 (V)	PE	3849
	C_9H_{14} (Tricyclo[4.2.1.0 ^{2,5}]nonane, (1 α ,2 α ,5 α ,6 α)-)	16526-28-6	**	9.65 ± 0.03 (V)	PE	4281
	C_9H_{14} (Tricyclo[4.2.1.0 ^{2,5}]nonane, <i>exo</i> -)	16526-27-5	**	9.5 ± 0.05 (V)	PE	4040
	$C_6H_{10} = C = C = CHCH_3$ (Cyclohexane, 1-propenylidene-)	20023-43-2	**	8.41	PE	5625
$C_9H_{16}^+$	$C_3H_7C(CH_3)_2C \equiv CCH_3$	XXXXX-XX-X	**	9.183 ± 0.010	PE	4575
	$(CH_3)_2CHC(CH_3)_2C \equiv CCH_3$	994-21-8	**	9.154 ± 0.010	PE	4575
	$CH_2 = CH(CH_2)_5CH = CH_2$	4900-30-5	**	9.51 ± 0.02 (V)	PE	4010
	$C_6H_{13}C \equiv CCH_3$	19447-29-1	**	9.289 ± 0.005	PE	4575
			**	9.32 ± 0.02	PI	5583

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₉H₁₆⁺	C ₃ H ₁₁ C≡CC ₂ H ₅	20184-89-8	** **	9.202±0.005	PE	4575
	1-C ₉ H ₁₆	3452-09-3	**	9.20±0.02	PI	5583
	4-C ₉ H ₁₆	20184-91-2	**	9.93±0.02	PI	5583
	C ₇ H ₁₀ (CH ₃) ₂	2034-53-9	**	8.30	PE	3687
	(Bicyclo[2.2.1]heptane, 7,7-dimethyl-)					
	C ₉ H ₁₆	283-19-2	**	9.6 (V)	PE	3991
	(Bicyclo[3.2.2]nonane)					
	C ₉ H ₁₆	280-65-9	**	9.35	PE	4735
	(Bicyclo[3.3.1]nonane)					
	C ₉ H ₁₆	286-60-2	**	9.4 (V)	PE	3509
	(Bicyclo[6.1.0]nonane)					
	C ₉ H ₁₆	39124-79-3	**	9.36 (V)	PE	3849
	(Bicyclo[6.1.0]nonane, <i>trans</i> -)					
	<i>n</i> -C ₃ H ₇ C ₆ H ₉	2539-75-5	**	8.43±0.01	PI	5556
	(Cyclohexene, 1-propyl-)					
	<i>n</i> -C ₃ H ₇ C ₆ H ₉	3983-06-0	**	8.80±0.01	PI	5556
	(Cyclohexene, 3-propyl-)					
	C ₉ H ₁₆	933-21-1	**	8.81±0.15	EI	5532
	(Cyclononene(Z))					
	<i>n</i> -C ₄ H ₉ C ₅ H ₇	2423-01-0	**	8.45±0.01	PI	5556
	(Cyclopentene, 1-butyl-)					
	<i>n</i> -C ₄ H ₉ C ₅ H ₇	22531-00-6	**	8.83±0.02	PI	5556
	(Cyclopentene, 3-butyl-)					
	<i>iso</i> -C ₄ H ₉ C ₅ H ₇	53098-47-8	**	8.44±0.01	PI	5556
	(Cyclopentene, 1-(2-methylpropyl)-)					
C₉H₁₈⁺	CH ₃ (CH ₂) ₃ C(CH ₃)=C(CH ₃) ₂	3074-64-4	**	8.145±0.005	PE	3957
	C ₂ H ₅ CH ₂ C(CH ₃)=C(CH ₃)C ₂ H ₅	3074-67-7	**	8.077±0.005	PE	3957
	(C ₂ H ₅) ₂ C=C(CH ₃)C ₂ H ₅	50787-13-8	**	8.128±0.005	PE	3957
	1-C ₉ H ₁₈	124-11-8	**	9.42±0.01	PI	5584
	<i>cis</i> -2-C ₉ H ₁₈	6434-77-1	**	8.90±0.01	PI	5584
	<i>cis</i> -3-C ₉ H ₁₈	20237-46-1	**	8.84±0.01	PI	5584
			**	9.01±0.01 (V)	PE	4939
	<i>cis</i> -4-C ₉ H ₁₈	10405-84-2	**	8.801±0.01	PI	5584
	<i>trans</i> -2-C ₉ H ₁₈	6434-78-2	**	8.90±0.01	PI	5584
	<i>trans</i> -3-C ₉ H ₁₈	20063-92-7	**	8.84±0.01	PI	5584
			**	9.01±0.01 (V)	PE	4939
	<i>trans</i> -4-C ₉ H ₁₈	10405-85-3	**	8.809±0.01	PI	5584
	(CH ₃) ₂ CHC ₆ H ₁₁	696-29-7	**	9.55±0.03	PI	5556
	(Cyclohexane, (1-methylethyl)-)					
	<i>n</i> -C ₄ H ₉ C ₅ H ₉	2040-95-1	**	9.95±0.03	PI	5556
	(Cyclopentane, butyl-)					
C₁₀H₆⁺	C ₆ H ₄ (C≡CH) ₂ (Benzene, 1,2 diethynyl-)	21792-52-9	**	8.69±0.02	PE	4374
	C ₆ H ₄ (C≡CH) ₂ (Benzene, 1,3 diethynyl-)	1785-61-1	**	8.82±0.02	PE	4374
	C ₆ H ₄ (C≡CH) ₂ (Benzene, 1,4 diethynyl-)	935-14-8	**	8.58±0.02	PE	4374
C₁₀H₈⁺	C ₁₀ H ₈	275-51-4	**	7.42 (V)	PE	5397
	(Azulene)		**	7.43±0.04	PE	4196
			**	7.44±0.03 (V)	PE	4828
	C ₁₀ H ₈	91-20-3	**	8.1	PI	3586
	(Naphthalene)		**	8.13	PE	3637

Table of Ion Energetics Measurements—Contigued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{10}H_8^+$	$C_{10}H_8$	91-20-3	**	8.15±0.02 (V)	PE	4913
			**	8.15	PE	3668
			**	8.15	PE	3638
			**	8.15	PE	4066
			**	8.15	PE	4515
			**	8.15 (V)	PE	3781
			**	8.15 (V)	PE	4701
			**	8.15 (V)	PE	5632
			**	8.18±0.03 (V)	PE	4828
			**	8.31±0.03 (V)	PE	4341
			**	8.25±0.01	EI	3588
			**	8.12	CTS	3922
$C_{10}H_8^{+2}$	$C_{10}H_8$ (Naphthalene)	91-20-3	**	22.8	OTH	5141
$C_{10}H_8^{+3}$	$C_{10}H_8$ (Naphthalene)	91-20-3	**	41.2±1.0	OTH	5141
$C_{10}H_{10}^+$	$C_6H_5CH=CHCH=CH_2$ (Benzene, 1,3-butadienyl-, (E)-)	16939-57-4	**	7.95	PE	3892
	$C_6H_5CH=C=CHCH_3$ (Benzene, 1,2-butadienyl-)	2327-98-2	**	8.15 (V)	PE	4493
	<i>cis</i> -(C_6H_5)CH=CHCH=CH ₂ (Benzene, 1,3-butadienyl-)	1515-78-2	**	8.39	PE	5202
	$C_6H_5C\equiv CC_2H_5$ (Benzene, 1-butyne-1-yl-)	622-76-4	**	8.33±0.02 (V)	PE	5409
	$C_6H_5C_4H_5$ (Benzene, 1-cyclobuten-1-yl-)	3365-26-2	**	8.22	PE	4347
	$C_6H_4(C_2H_5)_2$ (Benzene, 1,4-diethenyl-)	105-06-6	**	8.11 (V)	PE	5537
	$C_6H_4(CH_3)_2C\equiv CH$ (Benzene, 1-ethynyl-2,4-dimethyl-)	16017-30-4	**	8.31±0.02 (V)	PE	5409
	$CH_2=C(C_6H_5)CH=CH_2$ (Benzene, (1-methylene-2-propenyl)-)	2288-18-8	**	8.57	PE	3892
			**	8.60 (V)	PE	5537
	$C_6H_5C(CH_3)=C=CH_2$ (Benzene, 1-methyl-1,2-propadienyl-)	22433-39-2	**	8.07 (V)	PE	4493
	$C_6H_4(CH_3)C\equiv CCH_3$ (Benzene, 1-methyl-2-(1-propynyl)-)	57497-13-9	**	8.23±0.02 (V)	PE	5409
	$C_6H_4(CH_3)C\equiv CCH_3$ (Benzene, 1-methyl-3-(1-propynyl)-)	XXXXX-XX-X	**	8.26±0.02 (V)	PE	5409
	$C_6H_4(CH_3)C\equiv CCH_3$ (Benzene, 1-methyl-4-(1-propynyl)-)	2749-93-1	**	8.13±0.02 (V)	PE	5409
	$C_{10}H_8=CH_2$ (Bicyclo[4.2.1]nona-2,4,7-triene, 9-methylene-)	38898-39-4	**	8.25 (V)	PE	4094
	$C_8H_8(=CH_2)_2$ (Bicyclo[2.2.2]octa-2,5-diene, 7,8-bis(methylene)-)	51698-73-8	**	8.33±0.03 (V)	PE	4665
	$C_9H_8=CH_2$ (1H-Cyclobuta[cd]pentalene, 1a,3a,5a,5b-tetrahydro-1-methylene-)	64096-73-7	**	8.80	PE	4855
	$C_{10}H_{10}$ (Cyclopenta[cd]pentalene, 2a,4a,6a,6b-tetrahydro-)	6053-74-3	**	9.0 (V)	PE	4004
	$C_{10}H_{10}$ (Hexacyclo[4.4.0.0 ^{2,4} .0 ^{3,9} .0 ^{5,7} .0 ^{8,10}]decane)	XXXXX-XX-X	**	8.5 (V)	PE	5192
	$C_9H_8(=CH_2)$ (1H-Indene, 2,3-dihydro-1-methylene-)	1194-56-5	**	8.00±0.02	PE	3854
	$C_9H_8(=CH_2)$ (1,2-Methanodicyclopropa[cd,gh]pentalene, octahydro-3-methylene-)	64630-96-2	**	9.00±0.05 (V)	PE	5335

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{10}H_{10}^+$	$C_8H_8(=CH_2)$	64630-96-2	**	9.00 (V)	PE	5447
	$C_{10}H_{10}$ (1,2,3-Metheno-1 <i>H</i> -cycloprop[<i>cd</i>]indene, 2,2a,2b,3,5a,5b-hexahydro-)	26934-61-2	**	8.80 ± 0.2 (V)	PE	4338
	$C_{10}H_{10}$ (1,2,3-Metheno-1 <i>H</i> -dicycloprop[<i>cd,hi</i>]indene, octahydro-)	33840-23-2	**	8.50 (V)	PE	3849
	$C_{10}H_{10}$ (Pentacyclo[4.4.0.0 ^{2,5} .0 ^{3,8} .0 ^{1,7}]dec-9-ene)	5603-34-9	**	8.34 ± 0.05	PE	4449
	$C_9H_8(=CH_2)$ (Pentacyclo[4.3.0.0 ^{2,4} .0 ^{3,8} .0 ^{5,7}]nonane, 9-methylene-)	XXXXX-XX-X	**	9.15 ± 0.05 (V)	PE	5335
	$C_{10}H_{10}$ (Tetracyclo[5.3.0.0 ^{2,6} .0 ^{3,10}]deca-4,8-diene)	34324-40-8	**	8.44 (V)	PE	5578
	$C_{10}H_{10}$ (Tricyclo[6.2.0.0 ^{2,7}]deca-1,5,7-triene)	58436-35-4	**	8.18	PE	4952
	$C_{10}H_{10}$ (Tricyclo[6.2.0.0 ^{3,6}]deca-1(8)2,6-triene)	1610-51-1	**	8.17	PE	4952
	$C_{10}H_{11}OH$ (1-Naphthalenol, 1,2,3,4-tetrahydro-)	529-33-9	H ₂ O	8.87 ± 0.07	EI	4960
	$C_{10}H_{11}OH$ (2-Naphthalenol, 1,2,3,4-tetrahydro-)	530-91-6	H ₂ O	9.15 ± 0.02	EI	4960
	(C ₅ H ₅) ₂ Fe (Ferrocene)	102-54-5	Fe	13.96 ± 0.10	EI	3628
	(C ₅ H ₅) ₂ Ni (Nickelocene)	1271-28-9	Ni	13.3 ± 0.5	EI	3628
$C_{10}H_{12}^+$	$C_6H_5C_3H_7(CH_3)$ (Benzene, (1-methylcyclopropyl)-)	2214-14-4	**	8.73 (V)	PE	4815
	$C_6H_5C_4H_7$ (Benzene, cyclobutyl-)	4392-30-7	**	8.77 (V)	PE	4347
	$C_6H_5(CH_3)_2CH=CH_2$ (Benzene, 1-ethenyl-2,4-dimethyl-)	2234-20-0	**	8.22 (V)	PE	3964
	$C_6H_5(CH_3)_2CH=CH_2$ (Benzene, 2-ethenyl-1,3-dimethyl-)	2039-90-9	**	8.10 ± 0.02	PE	3854
	$C_6H_5(CH_3)_2CH=CH_2$ (Benzene, 2-ethenyl-1,4-dimethyl-)	2039-89-6	**	8.48 (V)	PE	3964
	$C_6H_5CH=C(CH_3)_2$ (Benzene, (2-methyl-1-propenyl)-)	768-49-0	**	8.00 ± 0.02	PE	3854
	$C_7H_6=C(CH_3)_2$ (Bicyclo[2.2.1]hepta-2,5-diene, 7-(1-methylethylidene)-)	36456-22-1	**	7.78 ± 0.04	EI	4097
	$C_8H_8(=CH_2)_2$ (Bicyclo[2.2.2]oct-2-ene, 5,6-bis(methylene)-)	36528-62-8	**	8.33 ± 0.03 (V)	PE	4665
	$C_{10}H_{12}$ (Bicyclo[3.2.1]oct-6-ene, 2,4-bis(methylene)-)	72569-84-7	**	8.33 (V)	PE	4249
	$C_{10}H_{12}$ (Cyclodecatetraene)	3451-55-6	**	8.98 (V)	PE	5325
	$C_6H_5(CH_3)_2(=CH_2)_2$ (1,4-Cyclohexadiene, 1,4-dimethyl-3,6-bis(methylene)-)	63238-49-3	**	~9.0 (V)	PE	5314
	$C_{10}H_{12}$ (Cyclopenta[<i>cd</i>]pentalene, 1,2,2a,4a,6a,6b-hexahydro-)	31678-74-7	**	8.55 (V)	PE	5392
	$C_{10}H_{12}$ (Dispiro[2.0.2.4]deca-7,9-diene)	30353-70-9	**	7.58 (V)	PE	4771
	$C_6H_5(C_2H_5)_2$ (Dispiro[2.2.2.2]deca-4,9-diene)	36262-33-6	**	9.00 (V)	PE	5606
	$C_6H_5CH_3$ (1 <i>H</i> -Indene, 2,3-dihydro-1-methyl-)	767-58-8	**	7.74 (V)	PE	5359
	$C_{10}H_{12}$ (1,2,3-Metheno-1 <i>H</i> -cycloprop[<i>cd</i>]indene, octahydro-)	28339-41-5	**	7.33 ± 0.05	PI	5278
			**	7.23	PE	4284
			**	7.82 (V)	PE	4385
			**	8.47	CTS	3546
			**	9.08 ± 0.02 (V)	PE	4338

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{10}H_{12}^+$	$C_{10}H_{12}$ (Naphthalene, 1,2,3,4-tetrahydro-)	119-64-2	**	8.44 (V)	PE	4063
			**	8.45 ± 0.02 (V)	PE	3854
			**	8.47	CTS	3546
	$C_{10}H_{12}$ (Naphthalene, 1,4,5,8-tetrahydro-)	493-04-9	**	8.27 (V)	PE	4531
	$C_{10}H_{12}$ (<i>trans</i> -Pentacyclo[3.3.2.0 ^{2,9} .0 ^{4,10} .0 ^{6,8}]decane)	XXXXX-XX-X	**	8.8 (V)	PE	5192
	$C_{10}H_{12}$ (Tetracyclo[5.2.1.0 ^{2,6} .0 ^{3,5}]dec-8-ene)	XXXXX-XX-X	**	8.83 ± 0.03 (V)	PE	4281
	$C_{10}H_{12}$ (Tetracyclo[5.3.0.0 ^{2,6} .0 ^{3,10}]dec-4-ene)	XXXXX-XX-X	**	8.72 (V)	PE	5578
	$C_{10}H_{12}$ (Tricyclo[4.2.2.0 ^{2,5}]deca-7,9-diene)	37707-19-0	**	8.8 (V)	PE	5605
	$C_{10}H_{10}(=CH_2)$ (Tricyclo[4.2.1.0 ^{2,5}]non-7-ene,9-methylene-)	XXXXX-XX-X	**	8.90 ± 0.05 (V)	PE	5335
	$C_{10}H_{12}$ (Tricycloprop[<i>cd,f,hi</i>]indene, decahydro-, (1 α ,1 β ,1 γ ,2 α ,2 β ,2 γ ,2 δ ,2 ϵ)-)	50895-59-5	**	8.78 (V)	PE	3849
$C_{10}H_{14}^+$	C_6H_5 (<i>tert</i> -C ₄ H ₉) (Benzene, (1,1-dimethylethyl)-)	98-06-6	**	8.83 (V)	PE	4280
			**	8.69	EI	5293
			**	8.64	CTS	3922
	$(n-C_3H_7C\equiv C)_2$	16387-71-6	**	8.72	PE	4731
	$C_6H_5C_4H_9$ (Benzene, butyl-)	104-51-8	**	8.68	EI	5293
	$C_6H_5(C_2H_5)_2$ (Benzene, 1,2-diethyl-)	135-01-3	**	8.51 (V)	PE	4063
			**	8.51	CTS	3546
	$C_6H_5(C_2H_5)_2$ (Benzene, 1,4-diethyl)	105-05-5	**	8.40	PE	5574
	$C_6H_5CH(CH_3)C_2H_5$ (Benzene, 1-methylpropyl)	135-98-8	**	8.68	EI	5293
	$C_6H_5CH_2CH(CH_3)_2$ (Benzene, 2-methylpropyl)	538-93-2	**	8.68	EI	5293
	$C_6H_5(CH_3)_3$ (Benzene, 1,2,3,4-tetramethyl-)	488-23-3	**	8.18	PE	4952
	$C_6H_5(CH_3)_3$ (Benzene, 1,2,3,5-tetramethyl-)	527-53-7	**	8.3 ± 0.03 (V)	PE	3713
	$C_6H_5(CH_3)_3$ (Benzene-1,2,4,5-tetramethyl)	95-93-2	**	8.05 (V)	PE	5629
			**	8.2	CTS	3543
	$C_7H_8=C(CH_3)_2$ (Bicyclo[2.2.1]hept-2-ene, 7-(1-methylethylidene)-)	14995-50-7	**	8.27	PE	3687
	$C_8H_{10}(=CH_2)_2$ (Bicyclo[2.2.2]octane, 2,3-bis(methylene)-)	36439-79-9	**	8.37 (V)	PE	4249
	$C_8H_{10}(=CH_2)_2$ (Bicyclo[3.2.1]octane, 2,4-bis(methylene)-)	XXXXX-XX-X	**	~ 8.9 (V)	PE	5314
	$C_9H_{12}=CH_2$ (1H-Cyclobuta[<i>cd</i>]pentalene, octahydro-1-methylene-)	64096-75-9	**	8.87	PE	4855
	$C_{10}H_{14}$ (Dispiro[2.0.2.4]dec-7-ene)	53143-76-3	**	8.48 (V)	PE	5359
	$C_{10}H_{14}$ (Tetracyclo[5.2.1.0 ^{2,6} .0 ^{3,5}]decane, (1 α ,2 α ,3 β ,5 β ,6 α ,7 α)-)	53862-36-5	**	9.20 ± 0.03 (V)	PE	4281
	$C_{10}H_{14}$ (Tetracyclo[5.3.0.0 ^{2,6} .0 ^{3,10}]decane)	XXXXX-XX-X	**	9.4 (V)	PE	5578
	$C_{10}H_{14}$ (Tetracyclo[7.1.0.0 ^{2,4} .0 ^{5,7}]decane (1 α ,2 α ,4 α ,5 α ,7 α ,9 α)-)	62279-40-7	**	8.8 (V)	PE	4964
	$C_{10}H_{14}$ (Tetracyclo[7.1.0.0 ^{2,4} .0 ^{5,7}]decane (1 α ,2 α ,4 α ,5 β ,7 α ,9 α)-)	62279-36-1	**	9.0 (V)	PE	4964

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{10}H_{11}^+$	$C_{10}H_{11}$ (Tetracyclo[7.1.0.0 ^{2,4} .0 ^{5,7}]decane(1 α ,2 α ,4 β ,5 α ,7 α ,9 α)–)	62279–35–0	**	8.88 (V)	PE	4964
	$C_{10}H_{14}$ (Tricyclo[4.2.2.0 ^{2,5}]dec–7–ene)	37706–26–6	**	9.0 (V)	PE	5605
	$C_6H_{12}(=CH_2)$ (Tricyclo[4.2.1.0 ^{2,5}]nonane,9–methylene–)	XXXXXX–XX–X	**	9.20 \pm 0.05 (V)	PE	5335
	$C_6H_3(CH_3)_4$ (Benzene, 1,2,4,5–tetramethyl–)	95–93–2	**	8.07	PE	4952
$C_{10}H_{15}^+$	$C_{10}H_{16}$ (Tricyclo[3.3.1.1 ^{3,7}]decane)	281–23–2	H	10.6	PI	4173
	$C_{10}H_{15}CH_3$	XXXXXX–XX–X	CH_3	9.5 \pm 0.1	PI	3918
	$C_{10}H_{15}CH_3$ (4,7–Methano–1 <i>H</i> –indene, octahydro–2–methyl–, (2 α ,3 α ,4 α ,7 α ,7 α)–)	50745–90–9	CH_3	10.1 \pm 0.1	PI	3918
	$C_{10}H_{15}CH_3$ (4,7–Methano–1 <i>H</i> –indene, octahydro–8–methyl–, stereoisomer)	50745–92–1	CH_3	9.6 \pm 0.1	PI	3918
	$C_{10}H_{15}C_2H_5$ (4,7–Methano–1 <i>H</i> –indene, 5–ethyloctahydro–, (3 α ,4 β ,5 α ,7 β ,7 α)–)	32787–97–6		9.9 \pm 0.1	PI	3918
	$C_{12}H_{20}$ (Tricyclo[3.3.1.1 ^{3,7}]decane, 2–ethyl–)	14451–87–7		10.5	PI	4173
$C_{10}H_{16}^+$	$C_5H_{11}C\equiv CC(CH_3)=CH_2$	70058–00–3	**	8.57 \pm 0.01	PE	5407
	$CH_3C\equiv CC(iso-C_3H_7)=C(CH_3)_2$	70058–04–7	**	7.89 \pm 0.01	PE	5407
	$C_6H_{13}=CH_2$ (Bicyclo[4.2.1]nonane, 9–methylene–)	40916–48–1	**	9.0 (V)	PE	4094
	$C_4H_3(CH_3)_3C\equiv CH$ (Cyclobutane,2–ethynyl–1,1,3,3–tetramethyl)	66438–89–9	**	9.33 (V)	PE	5607
	$C_6H_3(CH_3)_4$ (1,4–Cyclohexadiene, 3,3,6,6–tetramethyl–)	2223–54–3	**	8.81 (V)	PE	4385
	$C(CH_3)(CH_2)C_6H_8CH_3$ (Cyclohexene, 1–methyl–4–(1–methylethenyl)–)	138–86–3	**	8.3	EI	5200
	$(C_3H_5)_2C=C(CH_3)_2$ (Cyclopropane, 1,1'–(2–methyl–1–propenylidene)bis–)	27720–84–9	**	7.82	PI	3759
	$C_3H(CH_3)_3=C=C(CH_3)_2$ (Cyclopropane,trimethyl(2–methyl–1–propenylidene)–)	14803–30–6	**	7.57	PE	5625
	$C_{10}H_{16}$ (Dispiro[2.0.2.4]decane)	24029–74–1	**	9.22 (V)	PE	5359
	$C_{10}H_{16}$ (Dispiro[2.2.2.2] decane)	24518–94–3	**	9.17 (V)	PE	4385
	$C_{10}H_{16}$ (4,7–Methano–1 <i>H</i> –indene, octahydro–)	6004–38–2	**	9.3	PI	4173
	$C_{10}H_{16}$ (4,7–Methano–1 <i>H</i> –indene, octahydro–, (3 α ,4 β ,7 β ,7 α)–)	2825–82–3	**	9.35 \pm 0.05	PI	3918
	$C_{10}H_{16}$ (Spiro[bicyclo[2.2.2]octane–2,1'–cyclopropane])	53764–10–6	**	9.32 (V)	PE	4433
	$C_{10}H_{16}$ (Tricyclo[3.3.1.1 ^{3,7}]decane	281–23–2	**	9.30 \pm 0.01	S	3757
			**	9.25	PI	4173
			**	9.1 \pm 0.05	PE	3855
			**	9.20	PE	4735
			**	9.22	PE	3907
			**	9.23	PE	3886
			**	9.28 \pm 0.1	PE	3851
			**	9.28 (V)	PE	5043
			**	9.31 \pm 0.01	PE	3757
			**	9.55 (V)	PE	3990
			**	9.75 \pm 0.02 (V)	PE	4217
			**	9.75 (V)	PE	4000
			**	9.75 (V)	PE	5395

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{10}H_{16}^+$	$C_{10}H_{16}$ (Tricyclo[4.2.2.0 ^{2,5}]decane)	249-87-6	**	9.45 (V)	PE	5605
$C_{10}H_{17}^+$	$C_6H_9(CH_3)C_4H_8$ (Naphthalene, decahydro-1-methyl-(1 α ,4 α ,8 $\alpha\beta$))	4683-95-8	CH ₃	10.13 \pm 0.007	EI	5451
	$C_6H_9(CH_3)C_4H_8$ (Naphthalene, decahydro-1-methyl-(1 α ,4 $\alpha\beta$,8 α))	XXXXXX-XX-X	CH ₃	10.14 \pm 0.010	EI	5451
	$C_6H_9(CH_3)C_4H_8$ (Naphthalene, decahydro-2-methyl-(2 α ,4 α ,8 $\alpha\beta$))	14398-71-1	CH ₃	10.34 \pm 0.006	EI	5451
	$C_6H_9(CH_3)C_4H_8$ (Naphthalene, decahydro-2-methyl-(2 α ,4 $\alpha\beta$,8 α))	4683-94-7	CH ₃	10.33 \pm 0.009	EI	5451
$C_{10}H_{18}^+$	(<i>tert</i> -C ₄ H ₉)C \equiv C(<i>tert</i> -C ₄ H ₉)	17530-24-4	**	9.054 \pm 0.010	PE	4575
	C_6H_9 (<i>tert</i> -C ₄ H ₉) (Cyclohexene, 3-(1,1-dimethylethyl)-)	14072-87-8	**	8.94 \pm 0.02 (V)	PE	5420
	$C_4H_9C\equiv CC_4H_9$	1942-46-7	**	9.125 \pm 0.005	PE	4575
			**	9.14 \pm 0.02	PI	5583
	$C_6H_{13}C\equiv CC_2H_5$	2384-85-2	**	9.190 \pm 0.005	PE	4575
			**	9.19 \pm 0.02	PI	5583
	1-C ₁₀ H ₁₈	764-93-2	**	9.91 \pm 0.02	PI	5583
	2-C ₁₀ H ₁₈	2384-70-5	**	9.30 \pm 0.02	PI	5583
	4-C ₁₀ H ₁₈	2384-86-3	**	9.17 \pm 0.02	PI	5583
	$C_4H_3(CH_3)_4CH=CH_2$ (Cyclobutane, 2-ethenyl-1,1,3,3-tetramethyl)	66438-87-7	**	9.10 (V)	PE	5607
	$C_{10}H_{18}$ (Cyclodecene(E))	2198-20-1	**	8.91 \pm 0.15	EI	5532
	$C_{10}H_{18}$ (Cyclodecene(Z))	935-31-9	**	8.97 \pm 0.15	EI	5532
	$C_{10}H_{18}$ (Cyclodecene)	3618-12-0	**	8.98 (V)	PE	4267
	<i>n</i> -C ₄ H ₉ C ₆ H ₉ (Cyclohexene, 1-butyl-)	3282-53-9	**	8.41 \pm 0.01	PI	5556
	<i>n</i> -C ₄ H ₉ C ₆ H ₉ (Cyclohexene, 3-butyl-)	3983-07-1	**	8.80 \pm 0.02	PI	5556
	<i>n</i> -C ₄ H ₉ C ₆ H ₉ (Cyclohexene, 4-butyl-)	21524-26-5	**	8.85 \pm 0.02	PI	5556
	(CH ₃) ₂ CHCH ₂ C ₆ H ₉ (Cyclohexene, 1-(2-methylpropyl)-)	3983-03-7	**	8.40 \pm 0.01	PI	5556
	C ₂ H ₅ CH(CH ₃)C ₆ H ₉ (Cyclohexene, 3-(1-methylpropyl)-)	15232-91-4	**	8.74 \pm 0.02	PI	5556
	(CH ₃) ₂ CHCH ₂ C ₆ H ₉ (Cyclohexene, 3-(2-methylpropyl)-)	4104-56-7	**	8.77 \pm 0.02	PI	5556
	<i>n</i> -C ₅ H ₁₁ C ₅ H ₇ (Cyclopentene, 1-pentyl-)	4291-98-9	**	8.45 \pm 0.02	PI	5556
	<i>n</i> -C ₅ H ₁₁ C ₅ H ₇ (Cyclopentene, 3-pentyl-)	37689-14-8	**	8.84 \pm 0.02	PI	5556
	$C_{10}H_{18}$ (Naphthalene, decahydro-)	91-17-8	**	~9.35	PE	4735
	(CH ₃) ₂ CHC ₂ H ₅ C ₅ H ₇ (Cyclopentene, 1-(3-methylbutyl)-)	37689-15-9	**	8.44 \pm 0.02	PI	5556
	(CH ₃) ₂ CHC ₂ H ₅ C ₅ H ₇ (Cyclopentene, 3-(3-methylbutyl)-)	37689-16-0	**	8.83 \pm 0.02	PI	5556
$C_{10}H_{20}^+$	CH ₃ (CH ₂) ₄ C(C ₂ H ₅)=C(CH ₃) ₂	19780-61-1	**	8.101 \pm 0.005	PE	3957
	CH ₃ (CH ₂) ₄ C(CH ₃)=C(CH ₃) ₂	19781-18-1	**	8.132 \pm 0.005	PE	3957
	(CH ₃) ₃ CCH ₂ C(CH ₃)=C(CH ₃) ₂	33175-59-6	**	8.097 \pm 0.005	PE	3957
	1-C ₁₀ H ₂₀	872-05-9	**	9.417 \pm 0.006	PI	5584
			**	9.59 \pm 0.01 (V)	PE	4939

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{10}H_{20}^+$	<i>tert</i> - $C_3H_7)_2C=CH_2$	5857-68-1	**	8.795 ± 0.008	PE	3957
	<i>cis</i> -($CH_3)_3CCH=CHC(CH_3)_3$	692-47-7	**	8.695 ± 0.010	PE	3957
			**	8.95 (V)	PE	4084
	<i>cis</i> -2- $C_{10}H_{20}$	20348-51-0	**	8.899 ± 0.010	PI	5584
			**	9.08 ± 0.01 (V)	PE	4939
	<i>cis</i> -3- $C_{10}H_{20}$	19398-86-8	**	8.832 ± 0.009	PI	5584
			**	9.01 ± 0.01 (V)	PE	4939
	<i>cis</i> -4- $C_{10}H_{20}$	19398-88-0	**	8.784 ± 0.004	PI	5584
			**	8.97 ± 0.01 (V)	PE	4939
	<i>cis</i> -5- $C_{10}H_{20}$	7433-78-5	**	8.773 ± 0.006	PI	5584
			**	8.766 ± 0.005	PE	3957
			**	8.94 ± 0.01 (V)	PE	4939
	<i>cis</i> ((<i>iso</i> - C_3H_7)(CH_3) C_2)	60643-93-8	**	8.27 (V)	PE	4459
	<i>trans</i> -($CH_3)_3CCH=CHC(CH_3)_3$	692-48-8	**	8.741 ± 0.008	PE	3957
			**	8.89 (V)	PE	4084
	<i>trans</i> -2- $C_{10}H_{20}$	20063-97-2	**	8.903 ± 0.005	PI	5584
			**	9.06 ± 0.01 (V)	PE	4939
	<i>trans</i> -3- $C_{10}H_{20}$	19150-21-1	**	8.830 ± 0.006	PI	5584
			**	9.00 ± 0.01	PE	4939
	<i>trans</i> -4- $C_{10}H_{20}$	19398-89-1	**	8.782 ± 0.004	PI	5584
			**	8.97 ± 0.01 (V)	PE	4939
	<i>trans</i> -5- $C_{10}H_{20}$	7433-56-9	**	8.762 ± 0.012	PI	5584
			**	8.760 ± 0.005	PE	3957
			**	8.95 ± 0.01 (V)	PE	4939
	<i>trans</i> ((<i>iso</i> - C_3H_7)(CH_3) C_2)	60643-94-9	**	8.24 (V)	PE	4459
	$C_{10}H_{20}$ (Cyclodecane)	293-96-9	**	10.00 ± 0.05	EI	4319
	<i>n</i> - $C_4H_9C_6H_{11}$ (Cyclohexane, butyl-)	1678-93-9	**	9.57 ± 0.03	PI	5556
	$C_2H_5CH(CH_3)C_6H_{11}$ (Cyclohexane, (1-methylpropyl)-)	7058-01-7	**	9.51 ± 0.03	PI	5556
	$(CH_3)_2CHCH_2C_6H_{11}$ (Cyclohexane, (2-methylpropyl)-)	1678-98-4	**	9.54 ± 0.03	PI	5556
	<i>n</i> - $C_5H_{11}C_5H_9$ (Cyclopentane, pentyl-)	3741-00-2	**	9.91 ± 0.05	PI	5556
$C_{11}H_7^+$	$(C_6H_5)_2$ (1,1'-Biphenyl)	92-52-4	CH_3	14.80 ± 0.2	EI	4199
$C_{11}H_9^+$	$C_{10}H_7CH_3$ (Naphthalene, 1-methyl-)	90-12-0	H	13.15 ± 0.2	EI	4199
	$C_{10}H_7CH_3$ (Naphthalene, 2-methyl-)	91-57-6	H	13.15 ± 0.2	EI	4199
	$C_{10}H_6(CH_3)_2$ (Naphthalene, 1,5-dimethyl-)	571-61-9	CH_3	12.85 ± 0.05	EI	4199
	$C_{10}H_6(CH_3)_2$ (Naphthalene, 1,8-dimethyl-)	569-41-5	CH_3	12.70 ± 0.2	EI	4199
	$C_6H_5C \equiv CCH=CHCH_2Cl$ (Benzene, (5-chloro-3-penten-1-ynyl)-, (<i>E</i>)-)	40316-56-1		8.95 ± 0.05	EI	4044
	$C_{10}H_7CH_2Cl$ (Naphthalene, 1-(chloromethyl)-)	86-52-2		11.21 ± 0.05	EI	4044
	$C_{10}H_7CH_2Cl$ (Naphthalene, 2-(chloromethyl)-)	2506-41-4		11.15 ± 0.05	EI	4044
$C_{11}H_{10}^+$	$C_{10}H_7CH_3$ (Azulene, 1-methyl-)	769-31-3	**	7.26 ± 0.03 (V)	PE	4828
	$C_{10}H_7CH_3$ (Azulene, 4-methyl-)	17647-77-7	**	7.33 ± 0.03 (V)	PE	4828

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{11}H_{10}^+$	$C_{10}H_7CH_3$ (Azulene, 5-methyl-)	1654-55-3	**	7.30 ± 0.03 (V)	PE	4828
	$C_{10}H_7CH_3$ (Azulene, 6-methyl-)	1654-52-0	**	7.34 ± 0.03 (V)	PE	4828
	$C_{11}H_{10}$ (Bicyclo[4.4.1]undeca-1,3,5,7,9-pentaene)	2443-46-1	**	7.90 (V)	PE	3953
	$C_9H_8(=C=CH_2)$ (1,2-Methanodicyclop[<i>cdgh</i>]pentalene, 3-ethenylideneoctahydro-)	65915-89-1	**	8.75 (V)	PE	5447
	$C_{11}H_{10}$ (1,4-Methanonaphthalene, 1,4-dihydro-)	4453-90-1	**	8.30 ± 0.05 (V)	PE	4830
			**	8.32 ± 0.05 (V)	PE	4866
			**	8.34 ± 0.05 (V)	PE	5019
			**	8.34 (V)	PE	4541
			**	8.34 (V)	PE	4835
	$C_{10}H_7CH_3$ (Naphthalene, 1-methyl-)	90-12-0	**	7.95 (V)	PE	3685
			**	8.01 ± 0.03 (V)	PE	4828
			**	7.80 ± 0.03	El	3588
			**	8.50 ± 0.05	El	4199
			**	7.98	CTS	3758
	$C_{10}H_7CH_3$ (Naphthalene, 2-methyl-)	91-57-6	**	7.83	PE	4515
			**	7.93 (V)	PE	3685
			**	8.01 ± 0.03 (V)	PE	4828
			**	8.10 ± 0.03	El	3588
			**	8.45 ± 0.05	El	4199
	$(C_6H_5)_2S$ (Benzene, 1,1'-thiobis-)	139-66-2	CS	12.57 ± 0.1	El	3817
$C_{11}H_{12}^+$	$C_9H_8(C_2H_4)$ (Spiro[cyclopropane-1,3'-(1,2)methanodicyclop[<i>cdgh</i>]pentalene] octahydro-)	65915-88-0	**	9.05 (V)	PE	5447
	$C_6H_5C_5H_7$ (Benzene, 1-cyclopenten-1-yl-)	825-54-7	**	8.15 (V)	PE	4347
	$C_6H_5C_5H_7$ (Benzene, 2-cyclopenten-1-yl-)	37689-22-8	**	$\sim 9.2 \pm 0.05$ (V)	PE	4954
	$C_6H_5C_5H_7$ (Benzene, 3-cyclopenten-1-yl-)	39599-89-8	**	8.62 ± 0.01	PI	5556
	$C_6H_5C \equiv CC_3H_7$ (Benzene, 1-pentynyl-)	4250-81-1	**	8.29 ± 0.02 (V)	PE	5409
	$C_{11}H_{12}$ (1H-Cyclobut[<i>f</i>]indene, 2,4,5,6-tetrahydro-)	60582-10-7	**	8.05	PE	4952
	$C_{11}H_{12}$ (1H-Cyclobut[<i>e</i>]indene, 2,5,6,7-tetrahydro-)	60582-11-8	**	8.19	PE	4952
	$C_{11}H_{12}$ (1,4-Methanonaphthalene, 1,2,3,4-tetrahydro-)	4486-29-7	**	8.42 ± 0.05 (V)	PE	4830
			**	8.45 ± 0.05 (V)	PE	4866
	$C_{10}H_{10}(=CH_2)$ (Naphthalene, 1,2,3,4-tetrahydro-1-methylene-)	25108-63-8	**	7.90 ± 0.02 (V)	PE	3854
	$C_{11}H_{12}$ (Pentacycloundecene)	XXXXXX-XX-X	**	8.7 (V)	PE	5578
	$C_9H_8(=CH_2)_2$ (Tricyclo[3.2.2.0 ^{2,3}]non-6-ene, 8,9-bis(methylene)-(1 α ,2 α ,4 α ,5 α)-)	36439-89-1	**	8.37 ± 0.03 (V)	PE	4665
$C_{11}H_{14}^+$	$C_6H_5C_5H_9(C_2H_5)$ (Benzene, (1-ethylcyclopropyl)-)	50462-84-5	**	8.70 (V)	PE	4815
	$C_6H_5C_5H_9$ (Benzene, cyclopentyl-)	700-88-9	**	8.81 (V)	PE	4347
	$C_6H_5(CH_2)_3CH=CH_2$ (Benzene, 2-ethenyl-1,3,5-trimethyl-)	769-25-5	**	8.33 (V)	PE	3964

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{11}H_{11}^+$	$C_6H_5CH=CH(CH_2)_2CH_3$ (Benzene, 1-pentenyl-)	826-18-6	**	8.4 ± 0.07	EI	5374
	$C_{11}H_{11}$ (5 <i>H</i> -Benzocycloheptene, 6,7,8,9-tetrahydro-)	1075-16-7	**	8.40 ± 0.02 (V)	PE	3854
	$C_{11}H_{11}$ (Bicyclo[4.2.1]non-7-ene, 2,5-bis(methylene)-)	72569-85-8	**	8.44 (V)	PE	4063
	$C_{10}H_8(CH_3)_2$ (Indan, 1,1-dimethyl)	4912-92-9	**	8.47	CTS	3546
	$C_{10}H_8(CH_3)_2$ (1 <i>H</i> -Indene, 2,3-dihydro-2,2-dimethyl-)	20836-11-7	**	8.47	CTS	3546
	$C_{11}H_{11}$ (Spiro[2,4]hepta-1,4,6-triene, 1,2-diethyl)	49542-94-1	**	7.87 (V)	PE	5480
	$C_{10}H_{10}(=CH_2)_2$ (Tricyclo[3.2.2.0 ^{2,1}]nonane, 6,7-bis(methylene)-(1 α ,2 β ,4 β ,5 α)-)	36439-90-4	**	8.38 ± 0.03 (V)	PE	4665
	$C_8H_8=C(CH_3)_2$ (Tricyclo[3.2.1.0 ^{2,1}]oct-6-ene, 8-(1-methylethylidene)-, <i>endo</i> -)	XXXXX-XX-X	**	7.9	PE	3687
	$C_6H_5(CH_2)_5NH_2$ (Benzenepentanamine)	17734-21-3	NH_3	9.4 ± 0.1	EI	5374
$C_{11}H_{16}^+$	$C_6H_5CH_2$ (<i>tert</i> - C_4H_9) (Benzene, (2,2-dimethylpropyl)-)	1007-26-7	**	8.7 (V)	PE	4172
			**	8.77 (V)	PE	4280
			**	~8.8	PE	4589
	$C_6H_5(CH_3)C_4H_9$ (Benzene, 1-butyl-3-methyl-)	1595-04-6	**	8.42 ± 0.1	EI	3629
	$C_6H_5(CH_3)C_4H_9$ (Benzene, 1-butyl-4-methyl-)	1595-05-7	**	8.35 ± 0.1	EI	3629
	$C_6H(CH_3)_5$ (Benzene, pentamethyl-)	700-12-9	**	7.9	CTS	3543
	$C_{10}H_{10}C=C=C(CH_3)_2$ (Bicyclo[4.1.0]heptane, 7-(2-methyl-1-propenylidene)-)	4544-26-7	**	7.60	PE	5625
	$C_{10}H_{12}(=CH_2)_2$ (Bicyclo[4.2.1]nonane, 2,5-bis(methylene)-)	72569-86-9	**	8.90 (V)	PE	5314
	$(C_3H_5)_3C=CHC_3H_5$ (Cyclopropane, 1,1',1''-(1-ethenyl-2-ylidene)tris-)	23603-63-6	**	7.48	PI	3759
	$C_{11}H_{16}$ (Dispiro[cyclopropane-1,2'-bicyclo[2.2.1]heptane-3',1''-cyclopropane])	40827-29-0	**	8.76 (V)	PE	4433
	$C_{11}H_{16}$ (Spiro[2,4]hepta-4,6-diene, 1,2-diethyl)	59313-59-6	**	8.20 (V)	PE	5480
	$C_{10}H_{14}(=CH_2)$ (Tricyclo[3.3.1.1 ^{3,7}]decane, 2-methylene-)	875-72-9	**	8.82	PE	3886
	$C_8H_8(=CH_2)(CH_3)_2$ (Tricyclo[3.2.1.0 ^{2,4}]octane, 3,3-dimethyl-)	XXXXX-XX-X	**	8.86 ± 0.02 (V)	PE	4217
	$C_8H_{10}=C(CH_3)_2$ (Tricyclo[3.2.1.0 ^{2,4}]octane, 8-(1-methylethylidene)-, <i>endo</i> -)	XXXXX-XX-X	**	8.80 ± 0.05 (V)	PE	5335
			**	8.18	PE	3687
$C_{11}H_{17}^+$	$C_{10}H_{15}C_2H_5$ (4,7-Methano-1 <i>H</i> -indene, 5-ethyloctahydro-, (3 α ,4 β ,5 α ,7 β ,7 α)-)	32787-97-6	CH_3	10.0 ± 0.1	PI	3918
$C_{11}H_{18}^+$	$C_{10}H_{15}CH_3$ $C_7H_6(CH_3)_4$ (Cycloheptyne, 3,3,7,7-tetramethyl-)	XXXXX-XX-X	**	9.35 ± 0.05	PI	3918
	$C_6H_{11}C_5H_7$ (Cyclohexane, 2-cyclopenten-1-yl-)	33470-40-5	**	8.80 (V)	PE	4362
	$C_6H_{11}C_5H_7$ (Cyclohexane, 2-cyclopenten-1-yl-)	2690-15-5	**	8.95 ± 0.05 (V)	PE	4954
	$C_4(CH_3)_4=C=C(CH_3)_2$ (Cyclopropane, tetramethyl(2-methyl-1-propenylidene)-)	13303-30-5	**	7.46	PE	5625
	$C_{11}H_{18}$ (4,7-Ethano-1 <i>H</i> -indene, octahydro-)	38255-97-9	**	9.15	PI	4173

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{11}H_{18}^+$	$C_{11}H_{18}$ (4,7-Methanoazulene, decahydro-)	51027-86-2	**	9.25	PI	4173
	$C_{10}H_{13}CH_3$ (4,7-Methano-1 <i>H</i> -indene, octahydro-2-methyl-, (2 α ,3 $\alpha\beta$,4 α ,7 α ,7 $\alpha\beta$)-)	50745-90-9	**	9.35 \pm 0.05	PI	3918
	$C_{10}H_{13}CH_3$ (4,7-Methano-1 <i>H</i> -indene, octahydro-8-methyl-, stereoisomer)	50745-92-1	**	9.35 \pm 0.05	PI	3918
	$C_6H_7(CH_3)C_4H_8$ (Naphthalene, 1,2,3,4,4a,5,6,8a-octahydro-4a-methyl- <i>cis</i> -)	65698-42-2	**	8.92 \pm 0.02 (V)	PE	5420
	$C_6H_7(CH_3)C_4H_8$ (Naphthalene, 1,2,3,4,4a,5,6,8a-octahydro-4a-methyl- <i>trans</i> -)	XXXXX-XX-X	**	8.92 \pm 0.02 (V)	PE	5420
	$C_{11}H_{18}$ (Naphthalene, 1,2,3,4,4a,5,6,8a-octahydro-4a-methyl- <i>trans</i> -)	68211-37-0	**	8.92 \pm 0.05 (V)	PE	4842
	$C_{10}H_{13}CH_3$ (Tricyclo[3.3.1.1 ^{3,7}]decane, 1-methyl-)	768-91-2	**	9.17 \pm 0.02	PE	3886
$C_{11}H_{20}^+$	1- $C_{11}H_{20}$	2243-98-3	**	9.90 \pm 0.02	PI	5583
	2- $C_{11}H_{20}$	60212-29-5	**	9.28 \pm 0.02	PI	5583
	3- $C_{11}H_{20}$	60212-30-8	**	9.17 \pm 0.02	PI	5583
	4- $C_{11}H_{20}$	60212-31-9	**	9.13 \pm 0.02	PI	5583
	5- $C_{11}H_{20}$	2294-72-6	**	9.11 \pm 0.02	PI	5583
	(tert- C_4H_9) ₂ C=C=CH ₂	22585-31-5	**	8.55 (V)	PE	4019
	$C_{11}H_{20}$	13294-73-0	**	9.09 \pm 0.05 (V)	PE	4842
	$C_{11}H_{20}$ (Cyclohexane, 1-(1,1-dimethylethyl)-4-methylene)		**	9.09 \pm 0.02 (V)	PE	5420
	n - $C_6H_{11}C_6H_9$ (Cyclohexene, 1-pentyl-)	15232-85-6	**	8.37 \pm 0.02	PI	5556
	n - $C_6H_{13}C_5H_7$ (Cyclopentene, 1-hexyl-)	4291-99-0	**	8.43 \pm 0.01	PI	5556
	n - $C_6H_{13}C_5H_7$ (Cyclopentene, 3-hexyl-)	37689-18-2	**	8.84 \pm 0.02	PI	5556
	$C_{11}H_{20}$ (Cycloundecene(E))	13151-60-5	**	8.73 \pm 0.15	EI	5532
	$C_{11}H_{20}$ (Cycloundecene(Z))	13151-61-6	**	8.65 \pm 0.15	EI	5532
	$C_6H_7(CH_3)C_4H_8$ (Naphthalene, decahydro-2-methyl-(2 α ,4 $\alpha\beta$,8 $\alpha\alpha$)-)	4683-94-7	**	9.31 \pm 0.006	EI	5451
	$C_6H_7(CH_3)C_4H_8$ (Naphthalene, decahydro-1-methyl-(1 α ,4 $\alpha\alpha$,8 $\alpha\beta$)-)	4683-95-8	**	9.27 \pm 0.009	EI	5451
	$C_6H_7(CH_3)C_4H_8$ (Naphthalene, decahydro-1-methyl-(1 α ,4 $\alpha\beta$,8 $\alpha\alpha$)-)	XXXXX-XX-X	**	9.26 \pm 0.008	EI	5451
	$C_6H_7(CH_3)C_4H_8$ (Naphthalene, decahydro-2-methyl-(2 α ,4 $\alpha\alpha$,8 $\alpha\beta$)-)	14398-71-1	**	9.32 \pm 0.006	EI	5451
$C_{11}H_{22}^+$	$C_2H_5CH_2C(C_2H_5)=C(C_2H_5)_2$	50787-14-9	**	8.041 \pm 0.020	PE	3957
	n - $C_6H_{13}C_5H_9$ (Cyclopentane, hexyl-)	4457-00-5	**	9.90 \pm 0.03	PI	5556
$C_{12}H_6^+$	$C_6H_3(C\equiv CH)_3$ (Benzene, 1,3,5-triethynyl-)	7567-63-7	**	8.86 \pm 0.02	PE	4374
	$C_{12}H_6$ (1,5,9-Cyclododecatiene-3,7,11-triyn)	6555-54-0	**	7.69 (V)	PE	4652
$C_{12}H_8^+$	$C_{12}H_8$ (Acenaphthylene)	208-96-8	**	8.22 \pm 0.04	PE	4196
	$C_{12}H_8$ (Biphenylene)	259-79-0	**	7.53 \pm 0.05	PE	3684
			**	7.60 \pm 0.02 (V)	PE	3702

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{12}H_8^+$	$C_{12}H_8$	259-79-0	**	7.61 ± 0.04	PE	4196
	$C_{12}H_8$	7003-42-1	**	7.54 (V)	PE	4652
	(1,3,5,9-Cyclododecatetraene-7,11-diyne)					
$C_{12}H_9^+$	$(C_6H_5)_2$ (1,1'-Biphenyl)	92-52-4	H	13.60 ± 0.2	EI	4199
$C_{12}H_{10}^+$	$C_{12}H_{10}$ (Acenaphthylene, 1,2-dihydro-)	83-32-9	**	7.76 ± 0.03 (V)	PE	4828
			**	7.82 ± 0.04	PE	4196
	$(C_6H_5)_2$	92-52-4	**	7.95 ± 0.02	PE	3702
	(1,1'-Biphenyl)		**	8.34 (V)	PE	5619
			**	8.39 (V)	PE	5364
			**	8.80 ± 0.05	EI	4199
			**	8.35	CTS	3577
	$C_{12}H_{10}$	32277-35-3	**	7.84 ± 0.03 (V)	PE	4952
	(Cyclobuta[<i>a</i>]naphthalene, 1,2-dihydro-)					
	$C_{12}H_{10}$	6827-31-2	**	7.92 ± 0.03 (V)	PE	4952
	(Cyclobuta[<i>b</i>]naphthalene, 1,2-dihydro-)					
	$C_{12}H_{10}$	38310-40-6	**	7.96 ± 0.03 (V)	PE	4828
	(Cyclopent[<i>cd</i>]azulene, 2a, 8b-dihydro-)		**	7.46 (V)	PE	4008
	$C_{12}H_{10}$	19539-78-7	**	8.1 (V)	PE	4006
(4a, 8a-Ethenonaphthalene)						
$C_{12}H_{10}^{+2}$	$(C_6H_5)_2$ (1,1'-Biphenyl)	92-52-4	**	22.1	OTH	5141
$C_{12}H_{11}^+$	$C_{10}H_6(CH_3)_2$ (Naphthalene, 1,5-dimethyl-)	571-61-9	H	12.85 ± 0.05	EI	4199
	$C_{10}H_6(CH_3)_2$ (Naphthalene, 1,8-dimethyl-)	569-41-5	H	13.00 ± 0.2	EI	4199
$C_{12}H_{12}^+$	$C_{11}H_9(CH_3)$ (1,4-Methanonaphthalene, 1,4-dihydro-6-methyl-)	4897-73-8	**	8.12 ± 0.05 (V)	PE	5019
	$C_{10}H_6(CH_3)_2$	56594-77-5	**	7.18 ± 0.03 (V)	PE	4828
	(Azulene, 4,5-dimethyl-)					
	$C_{10}H_6(CH_3)_2$	56594-78-6	**	7.29 ± 0.03 (V)	PE	4828
	(Azulene, 4,6-dimethyl-)					
	$C_{10}H_6(CH_3)_2$	46030-99-3	**	7.20 ± 0.03 (V)	PE	4828
	(Azulene, 4,7-dimethyl-)					
	$C_{10}H_6(CH_3)_2$	7206-52-2	**	7.27 ± 0.03 (V)	PE	4828
	(Azulene, 4,8-dimethyl-)					
	$C_{10}H_6(CH_3)_2$	10556-12-4	**	7.17 ± 0.03 (V)	PE	4828
	(Azulene, 5,6-dimethyl-)					
	$C_{10}H_6(CH_3)_2$	56594-76-4	**	7.08 ± 0.03 (V)	PE	4828
	(Azulene, 5,7-dimethyl-)					
	$C_{12}H_{12}$	60323-50-4	**	9.24 (V)	PE	4781
	(1,5,9-Cyclododecatriyne)					
	$C_{12}H_{12}$	56004-38-7	**	8.50 (V)	PE	5606
	(Cyclopent[<i>cd</i>]azulene, 2a, 4a, 8a, 8b-tetrahydro-)					
	$C_{12}H_{12}$	38310-32-6	**	8.0 (V)	PE	4006
	(4a, 8a-Ethenonaphthalene, 1,4-dihydro-)					
	$C_{12}H_{12}$	24309-43-1	**	8.42 ± 0.05	PE	4866
	(5,9-Methano-5H-benzocycloheptene, 6,9-dihydro-)					

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{12}H_{12}^+$	$C_{12}H_{12}$ (2,7-Methano-1H-cyclopropa[<i>b</i>]naphthalene, 1a,2,7,7a-tetrahydro- (1 α ,2 β ,7 β ,7 α)-)	15577-76-1	**	8.40±0.05 (V)	PE	4866
	$C_{12}H_{12}$ (1,2,5-Metheno-1H-cyclobuta[<i>de</i>]naphthalene, 1a,2,4a,5,7a,7b-hexahydro-)	68109-02-4	**	8.30 (V)	PE	5119
	$C_{10}H_6(CH_3)_2$ (Naphthalene, 1,3-dimethyl-)	575-41-7	**	7.86±0.03 (V)	PE	4828
	$C_{10}H_6(CH_3)_2$ (Naphthalene, 1,4-dimethyl-)	571-58-4	**	7.82±0.03 (V)	PE	4828
	$C_{10}H_6(CH_3)_2$ (Naphthalene, 1,5-dimethyl-)	571-61-9	**	7.85±0.03 (V)	PE	4828
	$C_{10}H_6(CH_3)_2$ (Naphthalene, 1,8-dimethyl-)	569-41-5	**	8.30±0.05 7.64±0.03 (V)	El PE	4199 4828
	$C_{10}H_6(CH_3)_2$ (Naphthalene, 2,3-dimethyl-)	581-40-8	**	8.30±0.05 7.89±0.03 (V)	El PE	4199 4828
	$C_{10}H_6(CH_3)_2$ (Naphthalene, 2,7-dimethyl-)	582-16-1	**	7.89±0.03 (V)	PE	4828
$C_{12}H_{11}^+$	$C_6H_5C_6H_9$ (Benzene,2-cyclohexen-1-yl-)	15232-96-9	**	7.96±0.02	PI	5556
	$C_6H_5C_6H_9$ (Benzene,3-cyclohexen-1-yl-)	4994-16-5	**	8.57±0.01	PI	5556
	$C_6H_5CH_2C_5H_7$ (Benzene,(1-methyl-2-cyclopenten-1-yl)-)	XXXXX-XX-X	**	8.47±0.02	PI	5556
	$C_{11}H_{12}(=CH_2)$ (5 <i>H</i> -Benzocycloheptene, 6,7,8,9-tetrahydro-5-methylene-)	40562-09-2	**	8.45±0.02 (V)	PE	3854
	$C_7H_4(=CH_2)_2(=C(CH_3)_2)$ (Bicyclo[2.2.1]hept-2-ene,5,6-bis(methylene)-7-(1-methylethylidene)-)	36439-83-5	**	8.40±0.03 (V)	PE	4665
	$C_9H_8=C(CH_3)_2$ (1 <i>H</i> -Cyclobuta[<i>cd</i>]pentalene, 1a,3a,5a,5b-tetrahydro-1- (1-methylethylidene)-)	64096-77-1	**	8.15	PE	4855
	$C_{12}H_{14}$ (1,4:5,8-Dimethanonaphthalene, 1,4,4a,5,8,8a-hexahydro-, (1 α ,4 α ,4a α ,5 α ,8 α ,8a α)-)	1076-13-7	**	8.08±0.03 (V)	PE	4301
	$C_{12}H_{14}$ (1,4:5,8-Dimethanonaphthalene, 1,4,4a,5,8,8a-hexahydro-, (1 α ,4 α ,4a α ,5 β ,8 β ,8a α)-)	15914-94-0	**	8.46±0.03 (V)	PE	4301
	$C_{12}H_{14}$ (4a, 8a-Ethenonaphthalene, 1,2,3,4-tetrahydro-)	24139-33-1	**	8.0 (V)	PE	4006
	$C_{12}H_{14}$ (4a, 8a-Ethenonaphthalene, 1,4,5,8-tetrahydro-)	20295-17-4	**	8.7 (V)	PE	4006
	$C_{12}H_{14}$ (Hexacyclododecane)	XXXXX-XX-X	**	9.0 (V)	PE	5578
	$C_{12}H_{14}$ (5-Indacene, 1,2,3,5,6,7-hexahydro-)	495-52-3	**	7.94	PE	4952
	$C_{12}H_{14}$ (as-Indacene, 1,2,3,6,7,8-hexahydro-)	1076-17-1	**	8.09	PE	4952
	$C_{12}H_{14}$ (5,9-Methano-5 <i>H</i> -benzocycloheptene,6,7,8,9-tetrahydro-)	15391-62-5	**	8.52±0.05 (V)	PE	4866
	$C_9H_8(=C(CH_3)_2)$ (1,2-Methanodicyclopropa[<i>cd,gh</i>]pentalene,octahydro-3-(1-methylethylidene)-)	65915-87-9	**	8.35 (V)	PE	5447
	$C_{10}H_{10}(=CH_2)_2$ (Tricyclo[4.2.2.0 ^{2,5}]dec-7-ene,9,10-bis(methylene)-(1 α ,2 α ,5 α ,6 α)-)	57297-56-0	**	8.40±0.03 (V)	PE	4665
	$C_9H_8=C(CH_3)_2$ (Tricyclo[4.2.1.0 ^{2,5}]nona-3,7-diene, 9-(1-methylethylidene)-, (1 α ,2 α ,5 α ,6 α)-)	27237-73-6	**	8.33±0.03 (V)	PE	4281
$C_{12}H_{16}^+$	$C_6H_5C_3H_4(iso-C_3H_7)$ (Benzene, [1-(1-methylethyl)cyclopropyl]-)	63339-99-1	**	8.63 (V)	PE	4815
	$C_6H_5CH=CHC(CH_3)_3$ (Benzene, (3,3-dimethyl-1-butenyl)-, (E)-)	3846-66-0	**	7.80±0.04	El	4097

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.	
C ₁₂ H ₁₆ ⁺	C ₆ H ₅ CH=CHC(CH ₃) ₃ (Benzene, (3,3-dimethyl-1-butenyl)-, (Z)-)	3740-05-4	**	8.29±0.04	EI	4097	
	C ₆ H ₅ C(C(CH ₃) ₃)=CH ₂ (Benzene, (2,2-dimethyl-1-methylenepropyl)-)	5676-29-9	**	8.25±0.04	EI	4097	
	C ₁₂ H ₁₆ (Benzocyclooctene, 5,6,7,8,9,10-hexahydro-)	1076-69-3	**	8.42 (V)	PE	4063	
	C ₆ H ₄ (CH ₂) ₆ (Bicyclo[6.2.2]dodeca-8,10,11-triene)	53011-74-8	**	8.00 (V)	PE	5339	
	C ₁₂ H ₁₆ (4a,8a-Ethanonaphthalene, 1,4,5,8-tetrahydro-)	5103-78-6	**	9.00±0.05 (V)	PE	4593	
	C ₁₂ H ₁₆ (4a, 8a-Ethenonaphthalene, 1,2,3,4,5,8-hexahydro-)	24139-32-0	**	8.9 (V)	PE	4006	
	C ₁₂ H ₁₆ (Tetraspiro[2.0.2.0.2.0.2.0]dodecane)	24375-17-5	**	8.22 (V)	PE	4963	
	C ₁₀ H ₁₂ (=CH ₂) ₂ (Tricyclo[4.2.2.0 ^{2,5}]decane, 7,8-bis(methylene)-(1α,2β,5β,6α)-)	36439-92-6	**	8.27±0.03 (V)	PE	4665	
	C ₉ H ₁₀ =C(CH ₃) ₂ (Tricyclo[4.2.1.0 ^{2,5}]non-7-ene, 9-(1-methylethylidene)-, (1α,2α,5α,6α)-)	53848-19-4	**	8.39±0.03 (V)	PE	4281	
C ₁₂ H ₁₈ ⁺	(<i>n</i> -C ₄ H ₉ C≡C) ₂	1120-29-2	**	8.67	PE	4731	
	(<i>tert</i> -C ₄ H ₉ C≡C) ₂	6130-98-9	**	8.61±0.02 (V)	PE	4816	
	C ₆ H ₄ (CH(CH ₃) ₂) ₂ (Benzene, 1,4-bis(1-methylethyl))	100-18-5	**	8.35	PE	5574	
	C ₆ (CH ₃) ₆ (Benzene, hexamethyl-)	87-85-4	**	7.9 (V)	PE	5600	
			**	7.8	CTS	3543	
	C ₆ (CH ₃) ₆ (Bicyclo[2.2.0]hexa-2,5-diene, 1,2,3,4,5,6-hexamethyl-)	7641-77-2		7.83 (V)	PE	4296	
			**	7.92 (V)	PE	4297	
	C ₉ H ₁₂ =C(CH ₃) ₂ (1H-Cyclobuta[<i>cd</i>]pentalene, octahydro-1-(1-methylethylidene)-)	66149-44-8	**	8.19	PE	4855	
	C ₃ =(C(CH ₃) ₂) ₃ (Cyclopropane, tris (1-methylethylidene)-) (JC-Mean value of Jahn-Teller components)	2799-44-2	**	7.49	PE	4390	
	C ₁₂ H ₁₈ (1,4,5,8-Dimethanonaphthalene, decahydro-, (1α,4α,4α,5α,8α,8α)-)	53862-33-2	**	9.50±0.03 (V)	PE	4301	
	C ₁₂ H ₁₈ (1,4,5,8-Dimethanonaphthalene, decahydro-, (1α,4α,4α,5β,8β,8α)-)	15914-95-1	**	9.57±0.03 (V)	PE	4301	
	C ₁₂ H ₁₈ (Dispiro[cyclopropane-1,2'-bicyclo[2.2.2]octane-3',1'-cyclopropane])	40827-30-3	**	8.67 (V)	PE	4433	
	C ₁₂ H ₁₈ (4a, 8a-Ethenonaphthalene, 1,2,3,4,5,6,7,8-octahydro-)	38992-78-8	**	9.05 (V)	PE	4006	
	C ₉ H ₁₂ =C(CH ₃) ₂ (Tricyclo[4.2.1.0 ^{2,5}]nonane, 9-(1-methylethylidene)-, (1α,2α,5α,6α)-)	53848-20-7	**	8.30±0.03 (V)	PE	4281	
	(C ₆ (CH ₃) ₆)(CO) ₃ Cr (Chromium, tricarbonyl[(1,2,3,4,5,6-η)-hexamethylbenzene]-)	12088-11-8		8.55±0.1	EI	3788	
	C ₁₂ H ₂₀ ⁺	C ₁₂ H ₂₀ (Acenaphthylene, dodecahydro-)	2146-36-3	**	9.05	PI	4173
		C ₆ H ₁₁ C ₆ H ₉ (Cyclohexene, 1-cyclohexyl-)	3282-54-0	**	8.30±0.01	PI	5556
		C ₆ H ₁₁ C ₆ H ₉ (Cyclohexene, 3-cyclohexyl-)	1808-09-9	**	8.68±0.01	PI	5556
		C ₈ H ₈ (CH ₃) ₄ (Cyclooctyne, 3,3,8,8-tetramethyl-)	XXXXX-XX-X	**	8.90 (V)	PE	4362
		C ₁₀ H ₁₅ C ₂ H ₅ (4,7-Methano-1 <i>H</i> -indene, 5-ethyloctahydro-, (3α,4β,5α,7β,7α)-)	32787-97-6	**	9.35±0.05	PI	3918
C ₁₀ H ₁₃ (CH ₃) ₂ (Tricyclo[3.3.1.1 ^{3,7}]decane)		702-79-4	**	9.15	PE	4735	

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{12}H_{20}^+$	$C_{12}H_{20}$ (Tricyclo[3.3.1.1 ^{3,7}]decane, 2-ethyl-)	14451-87-7	**	9.2	PI	4173
$C_{12}H_{22}^+$	<i>trans</i> - $C_3H_5(tert-C_4H_9)_2=CH_2$	XXXXX-XX-X	**	8.22 ± 0.04	EI	4575
	$C_5H_{11}C \equiv CC_5H_{11}$	6975-99-1	**	9.090 ± 0.005	PE	4575
			**	9.06 ± 0.03	PI	5583
	<i>trans,trans</i> -((<i>tert</i> - C_4H_9)CH=CH) ₂	22430-49-5	**	8.23 ± 0.04	EI	4274
	1- $C_{12}H_{22}$	765-03-7	**	9.90 ± 0.02	PI	5583
	2- $C_{12}H_{22}$	629-49-2	**	9.29 ± 0.02	PI	5583
	3- $C_{12}H_{22}$	6790-27-8	**	9.17 ± 0.02	PI	5583
	4- $C_{12}H_{22}$	22058-01-1	**	9.14 ± 0.03	PI	5583
	5- $C_{12}H_{22}$	19780-12-2	**	9.09 ± 0.03	PI	5583
	$C_{12}H_{22}$ (Cyclododecene(E))	1486-75-5	**	8.74 ± 0.15	EI	5532
	$C_{12}H_{22}$ (Cyclododecene(Z))	1129-89-1	**	8.78 ± 0.15	EI	5532
	<i>n</i> - $C_6H_{13}C_6H_9$ (Cyclohexene, 1-hexyl-)	3964-66-7	**	8.37 ± 0.03	PI	5556
	<i>n</i> - $C_6H_{13}C_6H_9$ (Cyclohexene, 3-hexyl-)	15232-78-7	**	8.78 ± 0.01	PI	5556
	<i>n</i> - $C_7H_{15}C_5H_7$ (Cyclopentene, 1-heptyl-)	4292-00-6	**	8.41 ± 0.03	PI	5556
$C_{12}H_{21}^+$	<i>cis</i> -(CH_3) ₄ CCH ₂ C(CH ₃)=CHC(CH ₃) ₃	27656-50-4	**	8.346 ± 0.005	PE	3957
	$C_{12}H_{24}$ (Cyclododecane)	294-62-2	**	10.04 ± 0.05	EI	4319
$C_{13}H_9^+$	$C_{13}H_9CH_3$ (Phenanthrene, 4-methyl-)	832-64-4	C_2H_3	12.7 ± 0.1	EI	3454
	$C_{13}H_9(CH_3)_2$ (Phenanthrene, 4,5-dimethyl-)	3674-69-9		12.4 ± 0.1	EI	3454
	$C_6H_8(C_6H_5)_2$ (Benzene, 1,1'-(2-cyclohexen-1-ylidene)bis-)	31158-25-5		13.0 ± 0.4	EI	4018
	$C_6H_{10}(C_6H_5)_2$ (Benzene, 1,1'-cyclohexylidenebis-)	21113-55-3		13.3 ± 0.4	EI	4018
	$C_6H_7(CH_3)(C_6H_5)_2$ (Cyclohexene, 1-methyl-4,4-diphenyl-)	50592-48-8		13.4 ± 0.4	EI	4018
	$C_6H_9(CH_3)(C_6H_5)_2$ (Benzene, 1,1'-(4-methylcyclohexylidene)bis-)	32812-65-0		13.2 ± 0.4	EI	4018
	$C_{10}H_{13}(CH_3)(C_6H_5)_2$ (Naphthalene, 1,2,3,4,4a,5,6,7-octahydro-4a-methyl-2,2-diphenyl-)	50592-50-2		13.4 ± 0.4	EI	4018
	$C_6H_8(=O)(C_6H_5)_2$ (2-Cyclohexen-1-one, 4,4-diphenyl-)	4528-64-7		14.4 ± 0.4	EI	4018
	$C_6H_8(=O)(C_6H_5)_2$ (Cyclohexanone, 2,2-diphenyl-)	22612-62-0		13.8 ± 0.4	EI	4018
	$C_6H_8(=O)(C_6H_5)_2$ (Cyclohexanone, 4,4-diphenyl-)	4528-68-1		14.4 ± 0.4	EI	4018
	$C_6H_7(=O)(CH_3)(C_6H_5)_2$ (Cyclohexanone, 2-methyl-5,5-diphenyl-)	50592-49-9		14.0 ± 0.4	EI	4018
	$C_6H_7(=O)(CH_3)(C_6H_5)_2$ (Cyclohexanone, 6-methyl-2,2-diphenyl-)	50592-52-4		14.1 ± 0.4	EI	4018
	$C_6H_8(OH)(CH_3)(C_6H_5)_2$ (Cyclohexanol, 1-methyl-4,4-diphenyl-)	50592-47-7		13.9 ± 0.4	EI	4018
	$C_6H_8(=O)(CH_3)_2(C_6H_5)_2$ (Cyclohexanone, 2,2-dimethyl-6,6-diphenyl-)	50592-53-5		13.4 ± 0.4	EI	4018
	$C_6H_6(=O)(CH_3)(C_6H_5)_2CH_2CH_2CHO$ (Cyclohexanepropanal, 1-methyl-2-oxo-3,3-diphenyl-)	XXXXX-XX-X		13.6 ± 0.4	EI	4018
	$C_6H_6(=O)(CH_3)(C_6H_5)_2CH_2CH_2COCH_3$ (Cyclohexanone, 2-methyl-2-(3-oxobutyl)-6,6-diphenyl-)	50592-55-7		13.6 ± 0.4	EI	4018

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{13}H_9^+$	$C_6H_6(O)(C_6H_5)=CHS(CH_2)_3CH_3$ (Cyclohexanone, 6-[(butylthio)methylene]-2,2-diphenyl-)	50592-51-3	Cl	13.7 ± 0.4	EI	4018
	$C_6H_6(O)CH_2(C_6H_5)_2CH_2CH=C(CH_3)Cl$ (Cyclohexanone, 2-(3-chloro-2-butenyl)-2-methyl-6,6-diphenyl-)	50592-54-6		13.3 ± 0.4	EI	4018
$C_{13}H_{10}^+$	$C_{13}H_{10}$ (9H-Fluorene)	86-73-7	**	7.93 ± 0.02 (V)	PE	3702
			**	7.89 ± 0.03	PI	5552
			**	7.91 (V)	PE	5619
			**	8.52	EI	4228
$C_{13}H_{11}^+$	$(C_6H_5)_2CH_2$ (Benzene, 1,1'-methylenebis-)	101-81-5	H	11.2 ± 0.1	EI	5429
	$C_6H_5C_6H_4CH_3$ (1,1'-Biphenyl, 4-methyl-)	644-08-6	H	11.3 ± 0.1	EI	5429
	$C_{10}H_7CH=CHCH_3$ (Naphthalene, 1-(1-propenyl)-)	22767-77-7	H	12.2 ± 0.1	EI	5429
	$C_{11}H_9C_2H_4$ (Spiro[7H-benzocycloheptene-7,1'-cyclopropane])	29150-13-8	H	11.4 ± 0.1	EI	5429
	$C_6H_5(CH_3)C_6H_4CH_3$ (1,1'-Biphenyl, 2,2'-dimethyl-)	605-39-0	CH_3	11.75 ± 0.2	EI	4199
	$C_6H_5(CH_3)C_6H_4CH_3$ (1,1'-Biphenyl, 3,3'-dimethyl-)	612-75-9	CH_3	13.40 ± 0.2	EI	4199
	$C_6H_5(CH_3)C_6H_4CH_3$ (1,1'-Biphenyl, 4,4'-dimethyl-)	613-33-2	CH_3	12.65	EI	4199
	$(C_6H_5)_3CH$ (Benzene, 1,1',1''-methylidynetris-)	519-73-3	C_6H_5	10.9	PI	4055
	$C_6H_5CH_2C_6H_4OH$ (Phenol, 4-(phenylmethyl)-)	101-53-1	OH	11.0 ± 0.2	EI	3807
	$C_6H_5CH_2C_6H_4OCH_3$ (Benzene, 1-methoxy-4-(phenylmethyl)-)	834-14-0	OCH_3	11.6 ± 0.1	EI	3807
	$C_6H_5CH_2C_6H_4NO_2$ (Benzene, 1-nitro-4-(phenylmethyl)-)	1817-77-2	NO_2	10.5 ± 0.1	EI	3807
	$C_6H_5(CH_2D)C_6H_4CH_2D$ (1,1'-Biphenyl, 2,2'-di(methyl-d)-)	52889-80-2	CH_2D	11.80 ± 0.2	EI	4199
	$C_6H_5(CH_2D)C_6H_4CH_2D$ (1,1'-Biphenyl, 4,4'-di(methyl-d)-)	52889-82-4	CH_2D	12.95	EI	4199
$C_{13}H_9D_2^+$	$C_6H_5(CH_2D)C_6H_4CH_2D$ (1,1'-Biphenyl, 4,4'-di(methyl-d)-)	52889-82-4	CH_3	12.65 ± 0.2	EI	4199
$C_{13}H_{12}^+$	$(C_6H_5)_2CH_2$ (Benzene, 1,1'-methylenebis-)	101-81-5	**	8.55 ± 0.03	PI	5552
			**	8.67 ± 0.05 (V)	PE	4620
			**	8.8 (V)	PE	4211
			**	8.80 ± 0.02 (V)	PE	3854
			**	8.7 ± 0.1	EI	5429
			**	9.00 ± 0.05	EI	3806
			**	9.4	EI	4228
	$C_{13}H_{12}$ (1H-Benz[<i>f</i>]indene, 2,3-dihydro-)	1624-26-6	**	7.85 ± 0.03 (V)	PE	4828
	$C_6H_5C_6H_4CH_3$ (1,1'-Biphenyl, 2-methyl-)	643-58-3	**	8.10 ± 0.02	PE	3702
	$C_6H_5C_6H_4CH_3$ (1,1'-Biphenyl, 3-methyl-)	643-93-6	**	7.95 ± 0.02	PE	3702

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{13}H_{12}^+$	$C_6H_5C_6H_4CH_3$ (1,1'-Biphenyl, 4-methyl-)	644-08-6	**	7.80 ± 0.02	PE	3702
	$C_{13}H_{12}$ (5,10-Methanobenzocyclooctene, 5,10-dihydro-)	33627-04-2	**	8.6 ± 0.1	EI	5429
	$C_{13}H_{12}$ (3,8-Methanocyclobuta[b]naphthalene, 2a,3,8,8a-tetrahydro- (2 α ,3 α ,8 α ,8 α)-)	54483-68-4	**	8.25 ± 0.05	PE	4866
	$C_{13}H_{12}$ (3,8-Methanocyclobuta[b]naphthalene, 2a,3,8,8a-tetrahydro- (2 α ,3 β ,8 β ,8 α)-)	54483-73-7	**	8.35 ± 0.05 (V)	PE	4866
	$C_{10}H_7CH=CHCH_3$ (Naphthalene, 1-(1-propenyl)-)	22767-77-7	**	8.42 ± 0.05 (V)	PE	4866
	$C_{11}H_8C_2H_4$ (Spiro[7H-benzocycloheptene-7,1'-cyclopropane])	29150-13-8	**	8.4 ± 0.1	EI	5429
	$C_{11}H_8C_2H_4$ (Spiro[7H-benzocycloheptene-7,1'-cyclopropane])	29150-13-8	**	8.0 ± 0.1	EI	5429
$C_{13}H_{11}^+$	$C_{13}H_{14}$ (Azulene, 4,6,8-trimethyl-)	941-81-1	**	7.10 (V)	PE	5397
	$C_3H_3(C_6H_5)_2=C=C(CH_3)_2$ (Benzene, [2-(2-methyl-1-propenylidene)cyclopropyl]-)	4544-23-4	**	7.73	PE	5625
	$C_{13}H_{14}$ (1,2,4-Ethanylylidene-1H-cyclobuta[cd]pentalene, octahydro-5,7-bis (methylene)-)	42607-62-5	**	8.50	PE	4036
	$C_{13}H_{14}$ (5,10-Methanobenzocyclooctene, 5,6,7,10-tetrahydro-)	42919-37-9	**	8.66 ± 0.05	PE	4866
	$C_{13}H_{14}$ (5,10-Methanobenzocyclooctene, 5,6,9,10-tetrahydro-)	42919-38-0	**	8.54 ± 0.05	PE	4866
	$C_{13}H_{14}$ (3,8-Methanocyclobuta[b]naphthalene, 1,2,2a,3,8,8a-hexahydro- (2 α ,3 α ,8 α ,8 α)-)	67145-41-9	**	8.46 ± 0.05 (V)	PE	4866
	$C_{13}H_{14}$ (3,8-Methanocyclobuta[b]naphthalene, 1,2,2a,3,8,8a-hexahydro- (2 α ,3 β ,8 β ,8 α)-)	67109-90-4	**	8.60 ± 0.05 (V)	PE	4866
$C_{13}H_{16}^+$	$C_{13}H_{16}$ (Bicyclo[5.4.2]trideca-7,9,11,12-tetraene)	XXXXX-XX-X	**	8.2 (V)	PE	3999
	$C_{13}H_{16}$ (1,2,4-Ethanylylidene-1H-cyclobuta[cd]pentalene, octahydro-5-methyl-7-methylene-, (1 α ,1 $\alpha\beta$, 2 α ,3 $\alpha\beta$,4 α ,5 α ,5 $\alpha\beta$,5 $\beta\beta$)-)	42607-64-7	**	9.10	PE	4036
	$C_{13}H_{16}$ (5,10-Methanobenzocyclooctene, 5,6,7,8,9,10-hexahydro-)	33627-05-3	**	8.52 ± 0.05 (V)	PE	4866
$C_{13}H_{18}^+$	$C_6H_5C_3H_7(tert-C_3H_7)$ (Benzene, [1-(1,1-dimethylethyl)cyclopropyl]-)	63340-00-1	**	8.63 (V)	PE	4815
	$C_6H_4(CH_2)_7$ (Bicyclo[7.2.2]trideca-9,11,12-triene)	3761-63-5	**	8.21 (V)	PE	5339
$C_{13}H_{22}^+$	$C_3H_5(C_6H_5)_2$ (1,3-Cyclopentadiene, 1,3-bis(1,1-dimethylethyl)-)	XXXXX-XX-X	**	7.79 (V)	PE	4324
	$C_{13}H_{22}$ (1H-Phenylene, dodecahydro-)	2935-07-1	**	8.85	PI	4173
$C_{13}H_{21}^+$	1- $C_{13}H_{21}$	26186-02-7	**	9.90 ± 0.02	PI	5583
	2- $C_{13}H_{21}$	28467-75-6	**	9.28 ± 0.02	PI	5583
	3- $C_{13}H_{21}$	60186-78-9	**	9.14 ± 0.03	PI	5583
	4- $C_{13}H_{21}$	60186-79-0	**	9.07 ± 0.03	PI	5583
	5- $C_{13}H_{21}$	60186-80-3	**	9.09 ± 0.03	PI	5583

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{13}H_{21}^+$	6- $C_{13}H_{24}$	42371-66-4	**	9.05 ± 0.03	PI	5583
	n - $C_7H_{15}C_6H_9$ (Cyclohexene, 1-heptyl-)	15232-86-7	**	8.37 ± 0.02	PI	5556
	$C_{13}H_{24}$ (Cyclotridecene(E))	2484-65-3	**	8.63 ± 0.15	EI	5532
$C_{13}H_{26}^+$	$((CH_3)_3C)_2C=CHCH(CH_3)_2$	50787-12-7	**	8.307 ± 0.008	PE	3957
$C_{11}H_8^+$	$C_{18}H_8N_4$ (Dibenzo[<i>f,h</i>]quinoxaline-2,3-dicarbonitrile)	55408-49-6	$2(CN)_2$	11.91	EI	5488
$C_{11}H_{10}^+$	$C_{14}H_{10}$ (Anthracene)	120-12-7	**	7.47	S	3857
			**	7.4	PI	3586
			**	7.40	PI	3877
			**	7.40	PE	3668
			**	7.40 (V)	PE	5436
			**	7.40 (V)	PE	5630
			**	7.41 ± 0.02 (V)	PE	4913
			**	7.41 ± 0.05	PE	3684
			**	7.41 (V)	PE	4701
			**	7.42 ± 0.02 (V)	PE	4430
			**	7.43 ± 0.03 (V)	PE	4887
			**	7.44 ± 0.03 (V)	PE	4341
			**	7.47 ± 0.01	PE	3644
			**	7.47 ± 0.01	PE	3657
			**	7.47	PE	4364
			**	7.35	CTS	3577
			**	7.4	CTS	3543
	$C_6H_5C \equiv CC_6H_5$ (Benzene, 1,1'-(1,2-ethynediyl)bis-)	501-65-5	**	7.90 ± 0.02	PE	3854
			**	8.0 ± 0.05	PE	3684
	$C_{10}H_6C_3H_4$ (Cyclohepta[<i>de</i>]naphthalene)	208-20-8	**	7.10 (V)	PE	5597
	$C_{13}H_{10}$ (Cyclopenta[<i>ef</i>]heptalene)	209-42-7	**	6.84 (V)	PE	4572
	$C_{10}H_6C_3H_4$ (6b,8a-Dihydrocyclobut[<i>a</i>]acenaphthylene)	XXXXX-XX-X	**	7.72 (V)	PE	5597
	$C_{10}H_6C_3H_4$ (2,3-Dihydro-1,2,3-metheno-1H-phenalene)	XXXXX-XX-X	**	7.55 (V)	PE	5597
	$C_{11}H_{10}$ (Phenanthrene)	85-01-8	**	7.85 (V)	PE	5619
			**	7.86 ± 0.01	PE	3644
			**	7.86 ± 0.02 (V)	PE	4913
			**	7.86 (V)	PE	4701
			**	7.87 ± 0.02 (V)	PE	4430
			**	7.91 (V)	PE	5364
			**	7.92 ± 0.02 (V)	PE	3702
			**	7.92 ± 0.05	PE	3684
			**	8.03 ± 0.01	EI	3588
			**	8.25	CTS	3577
	$C_6H_8(C_6H_5)_2$ (Benzene, 1,1'-(2-cyclohexen-1-ylidene)bis-)	31158-25-5		10.4 ± 0.4	EI	4018
	$C_6H_{10}(C_6H_5)_2$ (Benzene, 1,1'-cyclohexylidenebis-)	21113-55-3		10.8 ± 0.4	EI	4018
	$C_6H_9(CH_3)(C_6H_5)_2$ (Benzene, 1,1'-(4-methylcyclohexylidene)bis-)	32812-65-0		10.2 ± 0.4	EI	4018
	$C_{10}H_{13}(CH_3)(C_6H_5)_2$ (Naphthalene, 1,2,3,4,4a,5,6,7-octahydro-4a-methyl-2,2-diphenyl-)	50592-50-2		9.3 ± 0.4	EI	4018

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{11}H_{10}^+$	$C_6H_8(=O)(C_6H_5)_2$ (Cyclohexanone, 2,2-diphenyl-)	22612-62-0		10.7 ± 0.4	EI	4018
	$C_6H_8(=O)(C_6H_5)_2$ (Cyclohexanone, 4,4-diphenyl-)	4528-68-1		13.2 ± 0.4	EI	4018
	$C_6H_7(=O)(CH_3)(C_6H_5)_2$ (Cyclohexanone, 2-methyl-5,5-diphenyl-)	50592-49-9		9.6 ± 0.4	EI	4018
	$C_6H_7(=O)(CH_3)(C_6H_5)_2$ (Cyclohexanone, 6-methyl-2,2-diphenyl-)	50592-52-4		10.3 ± 0.4	EI	4018
	$C_6H_8(OH)(CH_3)(C_6H_5)_2$ (Cyclohexanol, 1-methyl-4,4-diphenyl-)	50592-47-7		10.5 ± 0.4	EI	4018
	$C_6H_8(=O)(CH_3)(C_6H_5)_2CH_2CH_2CHO$ (Cyclohexanepropanal, 1-methyl-2-oxo-3,3-diphenyl-)	XXXXX-XX-X		10.2 ± 0.4	EI	4018
	$C_6H_8(=O)(CH_3)(C_6H_5)_2CH_2CH_2COCH_3$ (Cyclohexanone, 2-methyl-2-(3-oxobutyl)-6,6-diphenyl-)	50592-55-7	3	10.0 ± 0.4	EI	4018
	$C_{14}H_{12}S$ (Dibenzo[<i>b,e</i>]thiepin, 6,11-dihydro-)	1207-93-8	H_2S	9.76	EI	5414
	$C_{14}H_{12}SO_2$ (Dibenzo[<i>b,e</i>]thiepin, 6,11-dihydro-5,5-dioxide-)	23772-26-1	H_2SO_2	10.00	EI	5414
	$C_6H_6(=O)CH_2(C_6H_5)_2CH_2CH=C(CH_3)Cl$ (Cyclohexanone, 2-(3-chloro-2-butenyl)-2-methyl-6,6-diphenyl-)	50592-54-6	Cl	10.5 ± 0.4	EI	4018
$C_{14}H_{10}^{+2}$	$C_{14}H_{10}$ (Anthracene)	120-12-7	**	21.3	OTH	5141
	$C_6H_5C \equiv CC_6H_5$ (Benzene, 1,1'-(1,2-ethynediyl)bis-)	501-65-5	**	23.3	OTH	5141
$C_{14}H_{11}^+$	$C_{14}H_{12}S$ (Dibenzo[<i>b,e</i>]thiepin, 6,11-dihydro-)	1207-93-8	HS	11.05	EI	5414
	$C_{14}H_{12}SO_2$ (Dibenzo[<i>b,e</i>]thiepin, 6,11-dihydro-5,5-dioxide-)	23772-26-1	HSO_2	10.35	EI	5414
$C_{14}H_{12}^+$	$(C_6H_5)_2CH=CH$ (Benzene, 1,1'-(1,2-ethenediyl)bis-(E)-)	103-30-0	**	7.70 ± 0.03	PI	5552
			**	7.70 ± 0.02	PE	3854
			**	7.76	PE	3657
			**	7.87 (V)	PE	4464
			**	7.90 ± 0.05 (V)	PE	4377
			**	7.91 ± 0.05 (V)	PE	4333
	$C_6H_5CH=CHC_6H_5$	645-49-8	**	7.80 ± 0.02	PE	3854
	(Benzene, 1,1'-(1,2-ethenediyl)bis-(Z))		**	8.17 (V)	PE	4464
	$C_{14}H_{12}$ (Benzene, 1,1'-(1,2-ethenediyl)bis-)	588-59-0	**	7.5	PI	3586
			**	7.93 ± 0.03 (V)	PE	4767
			**	7.94	PE	5124
			**	10.30 (V)	PE	4856
			**	7.9	CTS	3577
	$(C_6H_5)_2C-CH_2$ (Benzene, 1,1'-ethenylidenebis-)	530-48-3	**	8.00 ± 0.02	PE	3854
	$C_{14}H_{12}$ (Phenanthrene, 9,10-dihydro-)	776-35-2	**	7.55 ± 0.02	PE	3702
			**	8.19 (V)	PE	5364
	$C_6H_8(C_6H_5)_2$ (Benzene, 1,1'-(2-cyclohexen-1-ylidene)bis-)	31158-25-5		9.8 ± 0.4	EI	4018
	$C_6H_{10}(C_6H_5)_2$ (Benzene, 1,1'-cyclohexylidenebis-)	21113-55-3		9.8 ± 0.4	EI	4018
	$C_6H_7(CH_3)(C_6H_5)_2$ (Cyclohexene, 1-methyl-4,4-diphenyl-)	50592-48-8		9.8 ± 0.4	EI	4018

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{11}H_{12}^+$	$C_6H_9(CH_3)(C_6H_5)_2$ (Benzene, 1,1'-(4-methylcyclohexylidene)bis-)	32812-65-0		10.1 ± 0.4	EI	4018
	$C_{10}H_{13}(CH_3)(C_6H_5)_2$ (Naphthalene, 1,2,3,4,4a,5,6,7-octahydro-4a-methyl-2,2-diphenyl-)	50592-50-2		9.5 ± 0.4	EI	4018
	$C_6H_8(=O)(C_6H_5)_2$ (Cyclohexanone, 2,2-diphenyl-)	22612-62-0		9.5 ± 0.4	EI	4018
	$C_6H_8(=O)(C_6H_5)_2$ (Cyclohexanone, 4,4-diphenyl-)	4528-68-1		10.0 ± 0.4	EI	4018
	$C_6H_7(=O)(CH_3)(C_6H_5)_2$ (Cyclohexanone, 2-methyl-5,5-diphenyl-)	50592-49-9		10.0 ± 0.4	EI	4018
	$C_6H_7(=O)(CH_3)(C_6H_5)_2$ (Cyclohexanone, 6-methyl-2,2-diphenyl-)	50592-52-4		10.4 ± 0.4	EI	4018
	$C_6H_8(OH)(CH_3)(C_6H_5)_2$ (Cyclohexanol, 1-methyl-4,4-diphenyl-)	50592-47-7		10.1 ± 0.4	EI	4018
	$C_6H_6(=O)(CH_3)_2(C_6H_5)_2$ (Cyclohexanone, 2,2-dimethyl-6,6-diphenyl-)	50592-53-5		9.9 ± 0.4	EI	4018
	$C_6H_6(=O)(CH_3)(C_6H_5)_2CH_2CH_2CHO$ (Cyclohexanepropenal, 1-methyl-2-oxo-3,3-diphenyl-)	XXXXXX-XX-X		10.3 ± 0.4	EI	4018
	$C_6H_6(=O)(CH_3)(C_6H_5)_2CH_2CH_2COCH_3$ (Cyclohexanone, 2-methyl-2-(3-oxobutyl)-6,6-diphenyl-)	50592-55-7		10.5 ± 0.4	EI	4018
	$C_6H_6(=O)(C_6H_5)=CHS(CH_2)_3CH_3$ (Cyclohexanone, 6-[(butylthio)methylene]-2,2-diphenyl-)	50592-51-3		10.1 ± 0.4	EI	4018
	$C_{14}H_{12}SO_2$ (Dibenzo[<i>b,e</i>]thiepin, 6,11-dihydro-5,5-dioxide-)	23772-26-1	SO_2	10.20	EI	5414
	$C_6H_6(=O)CH_3(C_6H_5)_2CH_2CH=C(CH_3)Cl$ (Cyclohexanone, 2-(3-chloro-2-butenyl)-2-methyl-6,6-diphenyl-)	50592-54-6	Cl	10.0 ± 0.4	EI	4018
$C_{14}H_{13}^+$	$C_6H_3(CH_3)C_6H_4CH_3$ (1,1'-Biphenyl, 2,2'-dimethyl-)	605-39-0	H	12.20 ± 0.2	EI	4199
	$C_6H_3(CH_3)C_6H_4CH_3$ (1,1'-Biphenyl, 3,3'-dimethyl-)	612-75-9	H	13.00 ± 0.2	EI	4199
	$C_6H_3(CH_3)C_6H_4CH_3$ (1,1'-Biphenyl, 4,4'-dimethyl-)	613-33-2	H	12.85	EI	4199
$C_{14}H_{14}^+$	$C_6H_5CH_2CH_2C_6H_5$ (Benzene, 1,1'-(1,2-ethanediy)bis-)	103-29-7	**	9.00 ± 0.05	EI	3806
	$(C_7H_7)_2$ (Bicycloheptatrienyl)	39473-62-6	**	8.62 (V)	PE	4820
	$C_{14}H_{14}$ (Bicyclo[2.2.2]octane, 2,3,5,6,7,8-hexa(methylene)-)	XXXXXX-XX-X	**	8.38 (V)	PE	5315
	$(C_6H_5CH_3)_2$ (1,1'-Biphenyl, 2,2'-dimethyl-)	605-39-0	**	8.05 ± 0.02	PE	3702
	$(C_6H_5CH_3)_2$ (1,1'-Biphenyl, 3,3'-dimethyl-)	612-75-9	**	8.80 ± 0.05	EI	4199
	$(C_6H_5CH_3)_2$ (1,1'-Biphenyl, 3,3'-dimethyl-)	612-75-9	**	7.85 ± 0.02	PE	3702
	$C_6H_3(CH_3)C_6H_4CH_3$ (1,1'-Biphenyl, 4,4'-dimethyl-)	613-33-2	**	8.70 ± 0.05	EI	4199
	$C_6H_5C_6H_4C_2H_5$ (1,1'-Biphenyl, 2-ethyl-)	1812-51-7	**	8.55 ± 0.02 (V)	PE	3702
	$C_{14}H_{14}$ (1,4-Methanonaphthalene, 1,4-dihydro-9-((1-methylethylidene)-)	7350-72-3	**	8.01 (V)	PE	4541
$C_{14}H_{16}^+$	$C_{14}H_{16}$ (Anthracene, 1,4,5,8,9-hexahydro-)	5910-28-1	**	8.16 (V)	PE	4531
	$C_3H_2(C_6H_5)(CH_3)=C=C(CH_3)_2$ (Benzene, [2-methyl-3-(2-methyl-1-propenylidene)cyclopropyl]- <i>cis</i> -)	33530-26-6	**	7.65	PE	5625
	$C_3H_2(C_6H_5)(CH_3)=C=C(CH_3)_2$ (Benzene, [2-methyl-3-(2-methyl-1-propenylidene)cyclopropyl]- <i>trans</i> -)	33530-27-7	**	7.63	PE	5625

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{11}H_{16}^+$	$C_{10}H_7(CH_2)_3CH_3$ (Naphthalene, 1-butyl-)	1634-09-0	**	7.76	PE	3960
	$C_{10}H_1(CH_3)_4$ (Naphthalene, 2,3,6,7-tetramethyl-)	1134-40-3	**	7.60±0.03 (V)	PE	4828
$C_{11}H_{18}^+$	<i>(tert-C_4H_9)_2(C≡C)_1</i>	20264-60-2	**	8.32±0.02 (V)	PE	4816
$C_{11}H_{22}^+$	$C_6H_5(C(CH_3)_2)_2$ (Benzene, 1,4-bis(1,1-dimethylethyl))	1012-72-2	**	8.30	PE	5574
$C_{11}H_{24}^+$	$(CH_3)_4CC(C_4H_9)C(C_4H_9)C(CH_3)CH_3$	54580-22-2	**	8.14 (V)	PE	4459
	$C_4(CH_3)_4(C(CH_3)_2)_2$ (Cyclobutane, 1,1,2,2-tetramethyl-3,4-bis(1-methylethylidene)-)	1133-23-9	**	7.49 (V)	PE	4459
$C_{11}H_{26}^+$	$C_{10}H_{13}C≡CC_{10}H_{13}$	35216-11-6	**	9.067±0.005	PE	4575
			**	9.03±0.04	PI	5583
	1- $C_{11}H_{26}$	765-10-6	**	9.89±0.02	PI	5583
	2- $C_{11}H_{26}$	638-60-8	**	9.26±0.03	PI	5583
	3- $C_{11}H_{26}$	60212-32-0	**	9.17±0.02	PI	5583
	4- $C_{11}H_{26}$	60212-33-1	**	9.11±0.03	PI	5583
	5- $C_{11}H_{26}$	60212-34-2	**	9.10±0.03	PI	5583
	6- $C_{11}H_{26}$	3730-08-3	**	9.09±0.02	PI	5583
	$((CH_3)_2C=C(iso-C_4H_7))_2$	54580-23-3	**	8.22 (V)	PE	4459
	$C_{14}H_{26}$ (Cyclotetradecene(E))	6568-33-8	**	8.70±0.15	EI	5532
			**	8.65±0.15	EI	5532
$C_{11}H_{28}^+$	$((CH_3)_3C)_2C=CHC(CH_3)_3$	28923-90-2	**	8.169±0.012	PE	3957
	$((iso-C_4H_7)_2C)_2$	7090-88-2	**	8.13 (V)	PE	4459
$C_{15}H_9^+$	$C_{14}H_9CH_3$ (Phenanthrene, 4-methyl-)	832-64-4	$H_2 + H$	14.4±0.1	EI	3454
	$C_{14}H_8(CH_3)_2$ (Phenanthrene, 2,7-dimethyl-)	1576-69-8		17.6±0.1	EI	3454
	$C_{14}H_8(CH_3)_2$ (Phenanthrene, 4,5-dimethyl-)	3674-69-9		15.1±0.1	EI	3454
	$C_{14}H_6(CH_3)_4$ (Phenanthrene, 2,4,5,7-tetramethyl-)	7396-38-5	3CH ₃	14.5±0.1	EI	3454
	$C_{14}H_6(CH_3)_4$ (Phenanthrene, 3,4,5,6-tetramethyl-)	7343-06-8	3CH ₃	16.5±0.1	EI	3454
$C_{15}H_{11}^+$	$C_{14}H_9CH_3$ (Phenanthrene, 4-methyl-)	832-64-4	H	12.0±0.1	EI	3454
	$C_{14}H_8(CH_3)_2$ (Phenanthrene, 2,7-dimethyl-)	1576-69-8	CH ₃	13.5±0.1	EI	3454
	$C_{14}H_8(CH_3)_2$ (Phenanthrene, 4,5-dimethyl-)	3674-69-9	CH ₃	10.8±0.1	EI	3454
$C_{15}H_{12}^+$	$C_{14}H_9CH_3$ (Anthracene, 9-methyl-)	779-02-2	**	7.24±0.03 (V)	PE	4887
			**	7.25	PE	4171
			**	7.27 (V)	PE	5436
	$C_3H_2(C_6H_5)_2$ (Benzene, 1,1'-(1-cyclopropene-1,2-diyl)bis-)	24168-52-3	**	10.27 (V)	PE	4856

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{15}H_{12}^+$	$(C_7H_5)_2C$ (Bicyclo[2.2.1]hepta-2,5-diene,7,7'-methanediylidenebis-)	73045-26-8	**	8.05 (V)	PE	5463
	$C_{15}H_{12}$ (1H-Cyclopropa[<i>l</i>]phenanthrene, 1a,9b-dihydro-)	949-41-7	**	7.77 (V)	PE	4927
	$C_{15}H_{12}$ (5H-Dibenzo [<i>a,d</i>]cycloheptene)	256-81-5	**	7.95 (V)	PE	4611
	$C_{11}H_9CH_3$ (Phenanthrene, 1-methyl-)	832-69-9	**	7.7 ± 0.03	EI	3588
	$C_{11}H_9CH_3$ (Phenanthrene, 2-methyl-)	2531-84-2	**	7.9 ± 0.04	EI	3588
	$C_{11}H_9CH_3$ (Phenanthrene, 3-methyl-)	832-71-3	**	7.68 ± 0.01	EI	3588
	$C_{11}H_9CH_3$ (Phenanthrene, 4-methyl-)	832-64-4	**	7.1 ± 0.1	EI	3454
	$C_{11}H_9CH_3$ (Phenanthrene, 9-methyl-)	883-20-5	**	7.70 ± 0.02	EI	3588
	$C_{11}H_9CH_3$ (Phenanthrene, 9-methyl-)	883-20-5	**	7.46 ± 0.03	EI	3588
	$(C_7H_5)_2C$ (Tetracyclo[3.2.0.0 ^{2,7} .0 ^{1,6}]heptane,3,3'-methanetetra-)	73050-57-4	**	7.80 (V)	PE	5463
$C_{15}H_{13}^+$	$C_6H_{10}(C_6H_5)_2$ (Benzene, 1,1'-cyclohexylidenebis-)	21113-55-3		10.3 ± 0.4	EI	4018
	$C_6H_9(CH_3)(C_6H_5)_2$ (Benzene, 1,1'-(4-methylcyclohexylidene)bis-)	32812-65-0		10.6 ± 0.4	EI	4018
	$C_{10}H_{13}(CH_3)(C_6H_5)_2$ (Naphthalene, 1,2,3,4,4a,5,6,7-octahydro-4a-methyl-2,2-diphenyl-)	50592-50-2		10.3 ± 0.4	EI	4018
	$C_6H_8(=O)(C_6H_5)_2$ (Cyclohexanone, 2,2-diphenyl-)	22612-62-0		9.7 ± 0.4	EI	4018
	$C_6H_8(=O)(C_6H_5)_2$ (Cyclohexanone, 4,4-diphenyl-)	4528-68-1		10.5 ± 0.4	EI	4018
	$C_6H_7(=O)(CH_3)(C_6H_5)_2$ (Cyclohexanone, 2-methyl-5,5-diphenyl-)	50592-49-9		10.8 ± 0.4	EI	4018
	$C_6H_7(=O)(CH_3)(C_6H_5)_2$ (Cyclohexanone, 6-methyl-2,2-diphenyl-)	50592-52-4		10.3 ± 0.4	EI	4018
	$C_6H_8(OH)(CH_3)(C_6H_5)_2$ (Cyclohexanol, 1-methyl-4,4-diphenyl-)	50592-47-7		10.1 ± 0.4	EI	4018
	$C_6H_6(=O)(CH_3)_2(C_6H_5)_2$ (Cyclohexanone, 2,2-dimethyl-6,6-diphenyl-)	50592-53-5		10.3 ± 0.4	EI	4018
	$C_{10}H_{11}(=O)(CH_3)(C_6H_5)_2$ (2(3 <i>H</i>)-Naphthalenone,4,4a,5,6,7,8-hexahydro-4a-methyl-7,7-diphenyl-)	50786-03-3		9.9 ± 0.4	EI	4018
	$C_6H_6(=O)(CH_3)(C_6H_5)_2CH_2CH_2CHO$ (Cyclohexanonepropanal, 1-methyl-2-oxo-3,3-diphenyl-)	XXXXX-XX-X		10.5 ± 0.4	EI	4018
	$C_6H_6(=O)(CH_3)(C_6H_5)_2CH_2CH_2COCH_3$ (Cyclohexanone, 2-methyl-2-(3-oxobutyl)-6,6-diphenyl-)	50592-55-7		10.6 ± 0.4	EI	4018
	$C_6H_6(=O)(C_6H_5)=CHS(CH_2)_3CH_3$ (Cyclohexanone, 6-[(butylthio)methylene]-2,2-diphenyl-)	50592-51-3		10.8 ± 0.4	EI	4018
	$C_6H_6(=O)CH_3(C_6H_5)_2CH_2CH=CH(C_6H_5)Cl$ (Cyclohexanone, 2-(3-chloro-2-butenyl)-2-methyl-6,6-diphenyl-)	50592-54-6	Cl	10.6 ± 0.4	EI	4018
$C_{15}H_{11}^+$	$C_{15}H_{14}$ (Benzene,1,1'-(1,2-cyclopropanediyl)bis-, <i>cis</i> -)	1138-48-3	**	8.20	PE	5260
	$C_{15}H_{14}$ (Benzene,1,1'-(1,2-cyclopropanediyl)bis-, <i>trans</i> -)	1138-47-2	**	8.05	PE	5260
	$(C_6H_5)_2CH=CCH_3$ (Benzene, <i>trans</i> -1,1'-(1-methyl-1,2-ethenediyl)bis-)	833-81-8	**	8.10 ± 0.05 (V)	PE	4377
	$(C_7H_5)_2CH_2$ (Dispiro[bicyclo[2.2.1]hepta-2,5-diene-7,1'-cyclopropane-2',7''-bicyclo[2.2.1]hepta[2,5]diene])	73045-27-9	**	8.25 (V)	PE	5463
	$(C_7H_5)_2CH_2$ (Dispiro[tetracyclo[3.2.0.0 ^{2,7} .0 ^{1,6}]heptane-3,1'-cyclopropane-2',3''-tetracyclo[3.2.0.0 ^{2,7} .0 ^{1,6}]heptane])	73050-58-5		8.4 (V)	PE	5463

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{15}H_{11}^+$	$C_{13}H_8(CH_3)_2$ (9 <i>H</i> -Fluorene, 9,9-dimethyl-)	4569-45-3	**	7.8 (V)	PE	4081
$C_{15}H_{16}^+$	$C_6H_5CH_2CH_2C_6H_4CH_3$ (Benzene, 1-methyl-2-(2-phenylethyl)-)	34403-05-9	**	8.64 ± 0.05	EI	5230
	$C_6H_5CH_2CH_2C_6H_4CH_3$ (Benzene, 1-methyl-3-(2-phenylethyl)-)	34403-06-0	**	8.59 ± 0.05	EI	5230
	$C_6H_5CH_2CH_2C_6H_4CH_3$ (Benzene, 1-methyl-4-(2-phenylethyl)-)	14310-20-4	**	8.58 ± 0.05	EI	5230
	$C_6H_5(CH_2)_3C_6H_5$ (Benzene, 1,1'-(1,3-propanediyl)bis-)	1081-75-0	**	8.60 ± 0.1	EI	4925
			**	8.79 ± 0.05	EI	5230
	$C_6H_5C_6H_4CH(CH_3)_2$ (1,1'-Biphenyl, 2-isopropyl-)	19486-60-3	**	8.50 ± 0.02 (V)	PE	3702
	$C_6H_5C_6H_4C_3H_7$ (1,1'-Biphenyl, 2-propyl-)	20282-28-4	**	8.50 ± 0.02 (V)	PE	3702
	$C_6H_5CH_2CH_2C_7H_7$ (1,3,5-Cycloheptatriene, 7-(2-phenylethyl)-)	712-32-6	**	8.06 ± 0.05	EI	5230
$C_{15}H_{18}^+$	$C_{10}H_3(CH_3)_5$ (Azulene, 1,2,4,6,8-pentamethyl-)	XXXXX-XX-X	**	6.85 ± 0.03 (V)	PE	4828
$C_{15}H_{21}^+$	$C_9H_6(CH_3)_6$ (Tetracyclo[6.1.0.0 ^{2,4} .0 ^{3,7}]nonane, 3,3,6,6,9,9-hexamethyl- (1 α ,2 α ,4 α ,5 β ,7 β ,8 α)-)	51898-92-1	**	8.5 (V)	PE	5192
	$C_{11}H_{12}(CH_3)_4$ (Undec-1,5,8-triene, 1,4,4,8-tetramethyl-)	XXXXX-XX-X	**	9.54 (V)	PE	5314
$C_{15}H_{28}^+$	$C_{15}H_{28}$ (Cyclopentadecene(E))	2146-35-2	**	8.83 ± 0.15	EI	5532
	$C_{15}H_{28}$ (Cyclopentadecene(Z))	34458-54-3	**	8.80 ± 0.15	EI	5532
$C_{16}H_8^+$	$C_{16}H_8$ (Dibenzo[<i>a,e</i>]cyclooctene, 5,6,11,12-tetrahydro-)	53397-65-2	**	7.76 (V)	PE	4652
$C_{16}H_{10}^+$	$C_{16}H_{10}$ (Azuleno[2,1,8- <i>ija</i>]azulene)	3526-04-3	**	7.14 ± 0.03 (V)	PE	4263
	$C_{16}H_{10}$ (Cyclohept[<i>g</i>]acenaphthylene)	194-32-1	**	7.13 ± 0.04	PE	4196
	$C_{16}H_{10}$ (Dibenzo[<i>a,e</i>]cyclooctene, 5,6-didehydro-)	53397-66-3	**	7.56 (V)	PE	4652
	$C_{16}H_{10}$ (Fluoranthene)	206-44-0	**	7.95 ± 0.04	PE	4196
	$C_{16}H_{10}$ (Pyrene)	129-00-0	**	7.41 (V)	PE	3951
			**	7.41 (V)	PE	4701
			**	7.42 (V)	PE	5364
			**	7.45 ± 0.01	PE	3657
			**	7.45	CTS	3577
	$C_{11}H_8(CH_3)_2$ (Phenanthrene, 2,7-dimethyl-)	1576-69-8		17.7 ± 0.1	EI	3454
	$C_{11}H_8(CH_3)_2$ (Phenanthrene, 4,5-dimethyl-)	3674-69-9		> 16	EI	3454

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{16}H_{11}^+$	$C_{11}H_6(CH_3)_4$ (Phenanthrene, 2,4,5,7-tetramethyl-)	7396-38-5	$2CH_3 + H$	15.6 ± 0.1	EI	3454
	$C_{14}H_6(CH_3)_4$ (Phenanthrene, 3,4,5,6-tetramethyl-)	7343-06-8	$2CH_3 + H$	14.3 ± 0.1	EI	3454
$C_{16}H_{12}^+$	$C_{14}H_8(=CH_2)_2$ (Anthracene, 9,10-dihydro-9,10-bis(methylene)-)	3302-51-0	**	7.95 (V)	PE	4540
	$C_{16}H_{12}$ (Azulene,2-phenyl-)	19227-07-7	**	7.20 (V)	PE	5397
	$C_{16}H_{12}$ (Azulene,6-phenyl-)	23781-82-0	**	7.25 (V)	PE	5397
	$C_{16}H_{12}$ (Azuleno[2,1,8- <i>ija</i>]azulene, 10b, 10c-dihydro-)	38765-94-5	**	7.33 ± 0.03 (V)	PE	4263
	$C_{16}H_{12}$ (Cyclohept[<i>fg</i>]acenaphthylene, 1,2-dihydro-)	518-03-6	**	6.85 ± 0.04	PE	4196
	$C_{16}H_{12}$ (Dibenzo[<i>a,e</i>]cyclooctene)	262-89-5	**	7.8 (V)	PE	4652
	$C_{10}H_7C_6H_5$ (Naphthalene, 2-phenyl-)	612-94-2	**	7.75	PE	4066
	$C_{14}H_6(CH_3)_4$ (Phenanthrene, 2,4,5,7-tetramethyl-)	7396-38-5	$2CH_3$	14.0 ± 0.1	EI	3454
	$C_{14}H_6(CH_3)_4$ (Phenanthrene, 3,4,5,6-tetramethyl-)	7343-06-8	$2CH_3$	13.5 ± 0.1	EI	3454
	$C_{16}H_{13}^+$	$C_{16}H_{14}$ (Phenanthrene, 2,7-dimethyl-)	1576-69-8	H	13.5 ± 0.1	EI
$C_{14}H_8(CH_3)_2$ (Phenanthrene, 4,5-dimethyl-)		3674-69-9	H	12.3 ± 0.1	EI	3454
$C_{16}H_{11}^+$	$C_6H_5(CH=CH)_2C_6H_5$ (Benzene, 1,1'-(1,3-butadiene-1,4-diyl)bis-)	886-65-7	**	7.54 ± 0.03 (V)	PE	4767
			**	7.56	PE	5124
			**	8.05	PE	5202
	$C_{14}H_8(CH_3)_2$ (Cyclopenta[<i>ef</i>]heptalene, 3,5-dimethyl-)	20672-23-5	**	6.73 (V)	PE	4572
	$C_{14}H_8(CH_3)_2$ (Phenanthrene, 2,7-dimethyl-)	1576-69-8	**	8.0 ± 0.1	EI	3454
	$C_{14}H_8(CH_3)_2$ (Phenanthrene, 4,5-dimethyl-)	3674-69-9	**	7.6 ± 0.1	EI	3454
	$C_6H_5(=O)(C_6H_5)_2$ (2-Cyclohexen-1-one, 4,4-diphenyl-)	4528-64-7		9.3 ± 0.4	EI	4018
	$C_6H_5(=O)(C_6H_5)_2$ (Cyclohexanone, 2,2-diphenyl-)	22612-62-0		9.6 ± 0.4	EI	4018
	$C_6H_5(=O)(CH_3)(C_6H_5)_2$ (Cyclohexanone, 6-methyl-2,2-diphenyl-)	50592-52-4		9.2 ± 0.4	EI	4018
	$C_6H_5(=O)(CH_3)_2(C_6H_5)_2$ (Cyclohexanone, 2,2-dimethyl-6,6-diphenyl-)	50592-53-5		9.4 ± 0.4	EI	4018
	$C_6H_5(=O)(CH_3)(C_6H_5)_2CH_2CH_2CHO$ (Cyclohexanepropanal, 1-methyl-2-oxo-3,3-diphenyl-)	XXXXXX-XX-X		9.4 ± 0.4	EI	4018
	$C_6H_5(=O)(CH_3)(C_6H_5)_2CH_2CH_2COCH_3$ (Cyclohexanone, 2-methyl-2-(3-oxobutyl)-6,6-diphenyl-)	50592-55-7		9.3 ± 0.4	EI	4018
	$C_6H_5(=O)CH_3(C_6H_5)_2CH_2CH= C(CH_3)Cl$ (Cyclohexanone, 2-(3-chloro-2-butenyl)-2-methyl-6,6-diphenyl-)	50592-54-6	Cl	9.1 ± 0.4	EI	4018
	$C_{16}H_{16}^+$	$C_{16}H_{16}$ (1,6-Ethenocyclopenta[<i>cd</i>]pentaleno[2,1,6- <i>gha</i>] pentalene, 1,1a,3a,3b,5a,5b,6,6a,6b,6c-decahydro-)	66081-13-8	**	8.74 (V)	PE

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{16}H_{16}^+$	$C_{16}H_{16}$ (Tricyclo[8.2.2.2 ^{1,7}]hexadeca-4,6,10,12,13,15-hexaene)	1633-22-3	**	8.00 (V)	PE	4510
			**	7.60	PE	4158
			**	7.8	PE	5600
			**	8.08 (V)	PE	4088
			**	8.10 (V)	PE	5575
	$(C_6H_5CH_2CH_2)_2$ (Tricyclo[9.3.1.1 ^{4,8}]hexadeca-1(15),4,6,8(16),11,13-hexaene)	2319-97-3	**	8.20 (V)	PE	5575
			**	8.24 (V)	PE	4088
			**	8.24 (V)	PE	4231
$C_{16}H_{18}^+$	$(tert-C_4H_9)_2(C\equiv C)_4$	20264-61-3	**	8.12±0.02 (V)	PE	4816
	$C_{10}H_5C_6H_4C_6H_5$ (1,1'-Biphenyl, 2-butyl-)	XXXXX-XX-X	**	8.50±0.02 (V)	PE	3702
$C_{16}H_{20}^+$	$C_{10}H_2(CH_3)_6$ (Azulene, 2,4,5,6,7,8-hexamethyl-)	63297-21-2	**	6.84±0.03 (V)	PE	4828
	$C_{10}H_2(CH_3)_6$ (Azulene, 3,4,5,6,7,8-hexamethyl-)	XXXXX-XX-X	**	6.73±0.03 (V)	PE	4828
	$C_8(CH_3)_4(=CH_2)_4$ (Tricyclo[3.3.0.0 ^{2,6}]octane, 1,2,5,6-tetramethyl- 3,4,7,8-tetrakis(methylene)-)	34106-16-6	**	7.97±0.02 (V)	PE	5562
	$C_8(CH_3)_4(=CH_2)_4$ (Tricyclo[4.2.0.0 ^{2,5}]octane, 1,2,5,6-tetramethyl- 3,4,7,8-tetrakis(methylene)-(1 α ,2 β ,5 β ,6 α)-)	34101-24-1	**	8.10±0.02 (V)	PE	5562
$C_{16}H_{26}^+$	$C_6H_5(CH_2C(CH_3)_2)_2$ (Benzene, 1,4-bis(2,2-dimethylpropyl))	1020-87-7	**	8.25	PE	5574
$C_{17}H_{12}^+$	$C_{17}H_{12}$ (10b,10c-Methanoazuleno[2,1,8- <i>ija</i>]azulene)	38801-41-1	**	7.15±0.03 (V)	PE	4263
	$C_{17}H_{12}$ (1,1'-Spirobi[1 <i>H</i> -indene])	165-42-4	**	7.80 (V)	PE	4083
$C_{17}H_{14}^+$	$C_{17}H_{14}$ (12 <i>H</i> -1,11-Methenobenzo[1,2:4,5]dicycloheptene, 11a,12a-dihydro-)	25835-57-8	**	7.37±0.03 (V)	PE	4263
$C_{17}H_{15}^+$	$C_{14}H_6(CH_3)_4$ (Phenanthrene, 2,4,5,7-tetramethyl-)	7396-38-5	CH ₃	11.5±0.1	EI	3454
	$C_{18}H_{18}$ (Phenanthrene, 3,4,5,6-tetramethyl-)	7343-06-8	CH ₃	11.5±0.1	EI	3454
$C_{18}H_{10}^+$	$C_{18}H_{10}$ (Naphthacene)	92-24-0	**	6.9	PI	3586
$C_{18}H_{12}^+$	$C_{18}H_{12}$ (Benz[<i>a</i>]anthracene)	56-55-3	**	7.41 (V)	PE	4701
			**	7.41±0.02 (V)	PE	4913
			**	7.42 (V)	PE	4039
			**	7.47±0.01	PE	3644
			**	7.56±0.01	PE	3657
			**	7.5	CTS	3577
	$C_{18}H_{12}$ (Benzo[<i>c</i>]phenanthrene)	195-19-7	**	7.60 (V)	PE	4701

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₁₈H₁₂⁺	C ₁₈ H ₁₂	195-19-7	**	7.62 (V)	PE	4039
			**	7.60±0.02 (V)	PE	4913
	C ₁₈ H ₁₂ (Chrysene)	218-01-9	**	7.59±0.02 (V)	PE	4913
			**	7.59 (V)	PE	4701
			**	7.60±0.01	PE	3644
			**	7.61 (V)	PE	4039
			**	7.75	CTS	3577
	C ₁₈ H ₁₂ (Naphthacene)	92-24-0	**	6.97±0.02 (V)	PE	4913
			**	7.01	PE	3668
			**	7.01 (V)	PE	4039
			**	7.04±0.04	PE	4196
	C ₁₈ H ₁₂ (Tetracyclo[6.6.2.1 ^{3,13} .1 ^{6,10}]octadeca-1,3(17),4,6,8,10(18),11,13,15-nonaene)	27313-56-0	**	8.06 (V)	PE	3647
			**	8.06 (V)	PE	4088
	C ₁₈ H ₁₂ (Triphenylene)	217-59-4	**	7.84±0.01	PE	3657
			**	7.86 (V)	PE	4039
			**	7.88±0.02 (V)	PE	4913
			**	7.88 (V)	PE	4701
			**	7.89±0.04	PE	4196
			**	8.1	CTS	3577
C₁₈H₁₄⁺	C ₅ H ₄ =C(C ₆ H ₅) ₂ (Benzene, (2,4-cyclopentadien-1-ylidenephnylmethyl)-)	2175-90-8	**	7.96 (V)	PE	4357
	(C ₆ H ₅) ₂ C ₆ H ₄ (1,1':4',1''-Terphenyl)	92-94-4	**	7.83	PE	4478
	C ₁₈ H ₁₄ (1,1':2',1''-Terphenyl)	84-15-1	**	7.99±0.01	PE	3657
	C ₁₈ H ₁₄ (1,1':3',1''-Terphenyl)	92-06-8	**	8.01±0.01	PE	3657
	(C ₆ H ₅) ₂ C ₆ H ₄ (1,1':4',1''-Terphenyl)	92-94-4	**	7.78±0.01	PE	3657
C₁₈H₁₆⁺	C ₆ H ₅ (CH=CH) ₃ C ₆ H ₅ (Benzene, 1,1'-(1,3,5-hexatriene-1,6-diyl)bis-)	1720-32-7	**	7.27±0.03 (V)	PE	4767
			**	7.33	PE	5124
	C ₁₈ H ₁₆ (11,1-Metheno-1H-cyclohepta[b]heptalene, 11a,12,13,13a-tetrahydro-)	28255-97-2	**	7.40±0.05 (V)	PE	4263
	C ₁₀ H ₁₀ (CH ₃) ₂ (Pyrene, 10b,10c-dihydro-10b,10c-dimethyl-, trans-)	956-84-3	**	6.7	PE	3948
C₁₈H₁₈⁺	(tert-C ₄ H ₉) ₂ (C≡C) ₅	XXXXX-XX-X	**	8.06±0.02 (V)	PE	4816
	C ₁₄ H ₉ C(CH ₃) ₃ (Anthracene, 9-(1,1-dimethylethyl)-)	13719-97-6	**	7.13±0.03 (V)	PE	4887
	C ₁₄ H ₆ (CH ₃) ₄ (Cyclopenta[ef]heptalene, 3,5,8,10-tetramethyl-)	17597-70-5	**	6.59 (V)	PE	4572
	(C ₆ H ₅) ₂ (CH ₂) ₆ ([2.2.2](1,2,4)Cyclophane)	XXXXX-XX-X	**	8.0±0.1 (V)	PE	5600
	C ₁₄ H ₆ (CH ₃) ₄ (Phenanthrene, 2,4,5,7-tetramethyl-)	7396-38-5	**	7.8±0.1	EI	3454
	C ₁₄ H ₆ (CH ₃) ₄ (Phenanthrene, 3,4,5,6-tetramethyl-)	7343-06-8	**	7.5±0.1	EI	3454
	(C ₆ H ₅) ₂ (CH ₂) ₆ (Tetracyclo[6.6.2.1 ^{3,13} .1 ^{6,10}]octadeca-1,3(17),6,8,10(18),13-hexaene)	27165-88-4	**	7.70±0.02 (V)	PE	5600
			**	8.20±0.05 (V)	PE	5600

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{18}H_{18}^+$	$(C_6H_5)_2(CH_2)_6$	27165-88-4	**	7.88 (V)	PE	4701
$C_{18}H_{20}^+$	$C_{10}H_{10}(C_6H_5)_2$ (Benzene, 1,1'-cyclohexylidenebis-)	21113-55-3	**	8.9 ± 0.2	EI	4074
	$C_{18}H_{20}$ (Naphthacene, 1,4,5,6,7,10,11,12-octahydro-)	60700-47-2	**	8.14 (V)	PE	4531
	$C_{16}H_{14}(CH_3)_2$ (Tricyclo[9.3.1.1 ^{4,8}]hexadeca-1(15),4,6,8(16),11,13-hexaene, 5,12-dimethyl-)	55705-29-8	**	7.98 (V)	PE	4231
$C_{19}H_{16}^+$	$(C_6H_5)_3CH$ (Benzene, 1,1',1''-methylidynetris-)	519-73-3	**	8.34 ± 0.03	PI	4055
			**	8.34 ± 0.04	PI	5552
			**	8.40 ± 0.05 (V)	PE	4620
$C_{19}H_{20}^+$	$C_6H_5(CH_2)_4(C_6H_5)_2$ (Cyclohexene, 1-methyl-4,4-diphenyl-)	50592-48-8	**	8.7 ± 0.4	EI	4018
	$C_6H_5(OH)(CH_2)_4(C_6H_5)_2$ (Cyclohexanol, 1-methyl-4,4-diphenyl-)	50592-47-7	H_2O	9.2 ± 0.4	EI	4018
$C_{19}H_{22}^+$	$C_6H_5(CH_2)_4(C_6H_5)_2$ (Benzene, 1,1'-(4-methylcyclohexylidene)bis-)	32812-65-0	**	8.8 ± 0.2	EI	4074
			**	8.8 ± 0.2	EI	4074
$C_{20}H_{12}^+$	$C_{20}H_{12}$ (Azuleno[1,2,3- <i>cd</i>]phenalene)	54100-60-6	**	6.58 (V)	PE	4637
	$C_{20}H_{12}$ (Azuleno[5,6,7- <i>cd</i>]phenalene)	6580-41-2	**	7.76 (V)	PE	4637
	$C_{20}H_{12}$ (Benzo[<i>a</i>]pyrene)	50-32-8	**	7.12 ± 0.01	PE	3644
			**	7.12 (V)	PE	5364
			**	7.39 ± 0.01	PE	3657
			**	7.41 (V)	PE	4701
	$C_{20}H_{12}$ (Benzo[<i>e</i>]pyrene)	192-97-2	**	7.43 ± 0.04	PE	4196
	$C_{20}H_{12}$ (Perylene)	198-55-0	**	6.90 ± 0.01	PE	3657
			**	6.97 (V)	PE	4712
			**	6.97 (V)	PE	4701
			**	7.00 ± 0.01	PE	3644
			**	7.1	CTS	3577
$C_{20}H_{14}^+$	$C_{14}H_9C_6H_5$ (Anthracene, 9-phenyl-)	602-55-1	**	7.25 (V)	PE	5436
			**	7.25 (V)	PE	5630
	$C_{14}H_9C_6H_5$ (Phenanthrene, 9-phenyl-)	844-20-2	**	7.65 (V)	PE	4262
$C_{20}H_{18}^+$	$(C_6H_5CHCHCHCH)_2$ (Benzene, 1,1'-(1,3,5,7-octatetraene-1,8-diyl)bis-)	22828-29-1	**	7.19	PE	5124
	$C_6H_5(CH_2CH_2)_2C_{10}H_6$ (5,14:8,11-Diethanobenzoicyclododecane, 6,7,12,13-tetrahydro-)	4432-72-8	**	7.60 (V)	PE	5575
	$C_6H_5(CH_2CH_2)_2C_{10}H_6$ (1,5-(Ethano[1,4]benzenoethano)naphthalene)	60058-13-1	**	7.56 (V)	PE	5575

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{20}H_{20}^+$	$(C_6H_5)_2(CH_2)_8$ ([2.2.2.2.2](1,2,3,4)Cyclophane)	XXXXXX-XX-X **		7.9 ± 0.1 (V)	PE	5600
	$(C_6H_5)_2(CH_2)_8$ ([2.2.2.2.2](1,2,3,5)Cyclophane)	XXXXXX-XX-X **		7.75 ± 0.02 (V)	PE	5600
	$(C_6H_5)_2(CH_2)_8$ ([2.2.2.2.2](1,2,4,5)Cyclophane)	XXXXXX-XX-X **		7.67 ± 0.02 (V)	PE	5600
$C_{20}H_{21}^+$	$C_{12}(CH_3)_8$ (1,3,7,9-Cyclododecatetrayne, 5,5,6,6,11,11,12,12-octamethyl-)	61414-48-0 **		8.27 ± 0.03 (V)	PE	4938
	$(C_6H_5)(CH_2)_3C_6(CH_3)_3$ (Tricyclo[8.2.2.2 ^{1,7}]hexadeca-4,6,10,12,13,15-hexaene, 4,5,7,8-tetramethyl-)	XXXXXX-XX-X **		7.47 (V)	PE	5600
	$C_{10}H_{12}(CH_3)_4$ (Tricyclo[8.2.2.2 ^{1,7}]hexadeca-4,6,10,12,13,15-hexaene, 5,11,13,15-tetramethyl-, stereoisomer)	35233-71-7 **		7.52 (V)	PE	4771
	$C_6H_5CH_2CH_2C_6(CH_3)_3CH_2CH_2$ (Tricyclo[8.2.2.2 ^{1,7}]hexadeca-4,6,10,12,13,15-hexaene, 5,6,15,16-tetramethyl-)	65304-59-8 **		7.55 (V)	PE	5575
$C_{20}H_{28}^+$	$(C_6H_5)_2C_2$ (Tricyclo[3.3.1.1 ^{3,7}]decane, tricyclo[3.3.1.1 ^{3,7}]decylidene-)	30541-56-1 **		7.84 (V)	PE	4459
$C_{20}H_{30}^+$	$C_6H_5(tert-C_4H_9)_3$ (Pentalene, 1,3,5-tris(1,1-dimethylethyl)-)	50356-52-0 **		7.11 (V)	PE	5613
$C_{20}H_{36}^+$	$((tert-C_4H_9)_2C \equiv C)_2$	33512-45-7 **		7.0	PE	5034
	$C_3(tert-C_4H_9)_4$ (1,3-Cyclobutadiene, 1,2,3,4-tetrakis(1,1-dimethylethyl)-)	66809-05-0 **		6.35 (V)	PE	5094
	$C_3(tert-C_4H_9)_4$ (Tricyclo[1.1.0.0 ^{2,4}]butane, tetrakis(1,1-dimethylethyl)-)	66809-06-1 **		7.50 (V)	PE	5094
	(JC-Mean value of Jahn-Teller components)					
$C_{21}H_{15}^+$	$C_{10}H_6(CH_3)_2C_{10}H_6CH_3$ (1,1'-Binaphthalene, 2,2'-dimethyl-)	32834-84-7	CH_3	13.25 ± 0.2	EI	4199
	$C_{10}H_6(CH_3)_2C_{10}H_6CH_3$ (1,1'-Binaphthalene, 3,3'-dimethyl-)	34042-82-5	CH_3	12.25 ± 0.2	EI	4199
	$C_{10}H_6(CH_3)_2C_{10}H_6CH_3$ (1,1'-Binaphthalene, 7,7'-dimethyl-)	34003-80-0	CH_3	12.75 ± 0.2	EI	4199
	$C_{10}H_6(CH_3)_2C_{10}H_6CH_3$ (1,1'-Binaphthalene, 8,8'-dimethyl-)	32693-05-3	CH_3	11.50 ± 0.2	EI	4199
	$C_{10}H_6(CH_3)_2C_{10}H_6CH_3$ (1,1'-Binaphthalene, 2,2'-dimethyl-)	32834-84-7	CH_3	13.25	EI	3477
	$C_{10}H_6(CH_3)_2C_{10}H_6CH_3$ (1,1'-Binaphthalene, 3,3'-dimethyl-)	34042-82-5	CH_3	12.25	EI	3477
	$C_{10}H_6(CH_3)_2C_{10}H_6CH_3$ (1,1'-Binaphthalene, 7,7'-dimethyl-)	34003-80-0	CH_3	12.75	EI	3477
	$C_{10}H_6(CH_3)_2C_{10}H_6CH_3$ (1,1'-Binaphthalene, 8,8'-dimethyl-)	32693-05-3	CH_3	11.50	EI	3477
	$C_{12}H_{30}$ (Cyclopropene, bis-3,3'-triphenyl-)	XXXXXX-XX-X **		9.3 ± 0.05	EI	4628
	$C_3(C_6H_5)_3BF_4$ (Cyclopropenium, triphenyl-, tetrafluoroborate(1-))	741-16-2	BF_3, F	9.3 ± 0.05	EI	4628
	$C_3(C_6H_5)_3Cl$ (Cyclopropenylum, triphenyl-, chloride)	58090-78-1	Cl	8.51 ± 0.05	EI	4628
	$C_3(C_6H_5)_3Br$ (Cyclopropenylum, triphenyl-, bromide)	4919-51-1	Br	8.35 ± 0.05	EI	4628
	$C_3(C_6H_5)_3I$ (Cyclopropenylum, triphenyl-, iodide)	58090-79-2	I	8.6 ± 0.05	EI	4628

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{21}H_{11}D^+$	$C_{10}H_6(CH_2D)C_{10}H_6CH_2D$ (1,1'-Binaphthalene, 2,2'-di(methyl- <i>d</i>)-)	52889-79-9	CH_2D	13.05 ± 0.2	EI	4199
	$C_{10}H_6(CH_2D)C_{10}H_6CH_2D$ (1,1'-Binaphthalene, 8,8'-di(methyl- <i>d</i>)-)	52963-27-6	CH_2D	11.35 ± 0.2	EI	4199
$C_{22}H_{12}^+$	$C_{22}H_{12}$ (Benzo[<i>g,h,i</i>]perylene)	191-24-2	**	7.15 (V)	PE	4701
			**	7.15 (V)	PE	4712
			**	7.19 ± 0.01	PE	3644
	$C_{22}H_{12}$ (Dibenzo[<i>d,e,f,m,n,o</i>]chrysene)	191-26-4	**	6.92 ± 0.04	PE	4196
$C_{22}H_{14}^+$	$C_{22}H_{14}$ (Benzo[<i>b</i>]chrysene)	214-17-5	**	7.20 ± 0.02 (V)	PE	4913
	$C_{22}H_{14}$ (Benzo[<i>a</i>]naphthacene)	226-88-0	**	6.97 ± 0.02 (V)	PE	4913
	$C_{22}H_{14}$ (Benzo[<i>b</i>]chrysene)	214-17-5	**	7.14 ± 0.04	PE	4196
	$C_{22}H_{14}$ (Benzo[<i>a</i>]naphthacene)	226-88-0	**	7.06 ± 0.04	PE	4196
	$C_{22}H_{14}$ (3,4-Benzotetraphene)	XXXXX-XX-X	**	7.35 ± 0.01	PE	3657
	$C_{22}H_{14}$ (Benzo[<i>b</i>]triphenylene)	215-58-7	**	7.39 ± 0.02 (V)	PE	4913
			**	7.39 (V)	PE	4701
			**	7.44 ± 0.04	PE	4196
	$C_{22}H_{14}$ (Dibenz[<i>a,h</i>]anthracene)	53-70-3	**	7.38 ± 0.02 (V)	PE	4913
			**	7.38 ± 0.04	PE	4196
			**	7.38 (V)	PE	4701
	$C_{22}H_{14}$ (Dibenz[<i>a,j</i>]anthracene)	224-41-9	**	7.39 ± 0.04	PE	4196
			**	7.40 ± 0.02 (V)	PE	4913
			**	7.40 (V)	PE	4701
	$C_{22}H_{14}$ (Dibenzo[<i>c,g</i>]phenanthrene)	188-52-3	**	7.47 ± 0.04	PE	4196
			**	7.51 (V)	PE	4488
			**	7.51 (V)	PE	4701
			**	7.51 ± 0.02 (V)	PE	4913
	$C_{22}H_{14}$ (Pentacene)	135-48-8	**	6.61 ± 0.02 (V)	PE	4913
			**	6.64	PE	3668
			**	6.74 ± 0.01	PE	3644
	$C_{22}H_{14}$ (Pentaphene)	222-93-5	**	7.27 ± 0.02 (V)	PE	4913
			**	7.27 (V)	PE	4701
			**	7.34 ± 0.04	PE	4196
	$C_{22}H_{14}$ (Picene)	213-46-7	**	7.52 ± 0.02 (V)	PE	4913
			**	7.52 (V)	PE	4701
			**	7.54 ± 0.04	PE	4196
$C_{22}H_{18}^+$	$C_{10}H_6(CH_3)C_{10}H_6CH_3$ (1,1'-Binaphthalene, 2,2'-dimethyl-)	32834-84-7	**	8.20 ± 0.05	EI	4199
	$C_{10}H_6(CH_3)C_{10}H_6CH_3$ (1,1'-Binaphthalene, 3,3'-dimethyl-)	34042-82-5	**	8.20 ± 0.05	EI	4199
	$C_{10}H_6(CH_3)C_{10}H_6CH_3$ (1,1'-Binaphthalene, 7,7'-dimethyl-)	34003-80-0	**	8.15 ± 0.05	EI	4199

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{22}H_{18}^+$	$C_{10}H_6(CH_3)C_{10}H_6CH_3$ (1,1'-Binaphthalene, 8,8'-dimethyl-)	32693-05-3	**	8.00 ± 0.05	EI	4199
	$C_{10}H_6(CH_3)C_{10}H_6CH_3$ (1,1'-Binaphthalene, 2,2'-dimethyl-)	32834-84-7	**	8.20	EI	3477
	$C_{10}H_6(CH_3)C_{10}H_6CH_3$ (1,1'-Binaphthalene, 3,3'-dimethyl-)	34042-82-5	**	8.00	EI	3477
	$C_{10}H_6(CH_3)C_{10}H_6CH_3$ (1,1'-Binaphthalene, 7,7'-dimethyl-)	34003-80-0	**	8.15	EI	3477
	$C_{10}H_6(CH_3)C_{10}H_6CH_3$ (1,1'-Binaphthalene, 8,8'-dimethyl-)	32693-05-3	**	8.00	EI	3477
$C_{22}H_{20}^+$	$(C_6H_5CHCHCHCHCH)_2$ (Benzene, 1,1'-(1,3,5,7,9-decapentaene-1,10-diyl)bis-)	XXXXX-XX-X	**	7.05	PE	5124
	$(C_6H)_2(CH_2)_{10}$ ([2.2.2.2.2](1,2,3,4,5)Cyclophane)	XXXXX-XX-X	**	7.67 ± 0.02 (V)	PE	5600
$C_{23}H_{26}^+$	$C_{10}H_{14}(CH_3)(C_6H_5)_2$ (Naphthalene, 1,2,3,4,4a,5,6,7-octahydro-4a-methyl-2,2-diphenyl-)	50592-50-2	**	8.9 ± 0.2	EI	4074
	$C_{24}H_{12}$ (Coronene)	191-07-1	**	7.29 (V)	PE	4701
$C_{24}H_{12}^+$	$C_{24}H_{12}$ (Tribenzo[<i>a,e,i</i>]cyclododecene, 5,6,11,12,17,18-hexadehydro-)		**	7.29 (V)	PE	4712
			**	7.34 (V)	PE	3951
			**	7.5	CTS	3577
			**	7.45 (V)	PE	4652
			**			
			**			
$C_{24}H_{14}^+$	$C_{24}H_{14}$ (Benzo[<i>rst</i>]pentaphene)	189-55-9	**	7.07 ± 0.04	PE	4196
	$C_{24}H_{14}$ (Benzo[<i>a</i>]perylene)	191-85-5	**	6.71 (V)	PE	4712
	$C_{24}H_{14}$ (Benzo[<i>b</i>]perylene)	197-70-6	**	6.89 (V)	PE	4712
	$C_{24}H_{14}$ (Dibenzo[<i>de,qr</i>]naphthacene)	193-09-9	**	6.92 ± 0.04	PE	4196
	$C_{24}H_{14}$ (Dibenzo[<i>fg,op</i>]naphthacene)	192-51-8	**	7.41 ± 0.04	PE	4196
	$C_{24}H_{14}$ (Dibenzo[<i>a,h</i>]pyrene)	XXXXX-XX-X	**	7.39 (V)	PE	4701
	$(C_{10}H_6C_2H_2)_2$ (Pentacyclo[10.4.4.4. ^{1,9} .0 ^{6,22} .0 ^{15,19}]tetracos-2,4,6,8,10,12,14,16,17,19,21,23-dodecaene)	43012-17-5	**	7.40 (V)	PE	5575
	$(C_{10}H_6C_2H_2)_2$ (Pentacyclo[11.5.3.3. ^{4,10} .0 ^{7,23} .0 ^{16,20}]tetracos-1(19),2,4,6,8,10(22),11,13,15,17,20,23-dodecaene)	51557-75-6	**	7.20 (V)	PE	5575
$C_{24}H_{20}^+$	$(C_{10}H_6CH_2CH_2)_2$ (5,16:8,13-Diethenodibenzo[<i>a,g</i>]cyclododecene, 6,7,14,15-tetrahydro-)	14724-91-5	**	7.25 (V)	PE	5575
	$(C_{10}H_6CH_2CH_2)_2$ (Pentacyclo[10.4.4.4. ^{1,9} .0 ^{5,21} .0 ^{16,20}]tetracos-1(17),4,6,8,12,14,16(20),18,21,23-decaene)	54835-57-3	**	7.50 (V)	PE	5575
	$(C_{10}H_6CH_2CH_2)_2$ (Pentacyclo[10.4.4.4. ^{1,9} .0 ^{5,21} .0 ^{16,20}]tetracos-1(17),4,6,8,12,14,16(20),18,21,23-decaene)		**	7.05 (V)	PE	5575

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{21}H_{20}^+$	$(C_{10}H_6CH_2CH_2)_2$	54835-57-3	**	7.25 (V)	PE	5575
	$(C_{10}H_6CH_2CH_2)_2$ (Pentacyclo[10.4.4.4 ^{4,9} .0 ^{6,22} .0 ^{15,19}]tetracosa-4,6,8,12,14,16, 17,19,21,23-decaene)	73608-51-2	**	7.52 (V)	PE	5575
	$(C_{10}H_6CH_2CH_2)_2$ (Pentacyclo[11.5.3.3 ^{4,10} .0 ^{7,23} .0 ^{16,20}]tetracosa-1(19),4,6,8,10(22), 13,15,17,20,23-decaene)	7130-24-7	**	7.37 (V)	PE	5575
	$(C_{10}H_6CH_2CH_2)_2$ (Pentacyclo[13.3.2.2 ^{6,10} .1 ^{3,18} .1 ^{9,12}]tetracosa-1,3(21),6,8,10, 12(22),15,17,19,23-decaene)	73608-52-3	**	6.60 (V)	PE	5575
$C_{21}H_{22}^+$	$(C_6H_5CHCHCHCHCHCH)_2$	XXXXXX-XX-X	**	7.07	PE	5124
	(Benzene,1,1'-(1,3,5,7,9,11-dodecahexaene-1,12-diyl)bis-) $C_{10}H_7(CH_2)_4C_{10}H_7$ (Naphthalene, 1,1'-(1,4-butanediyl)bis-)	29571-17-3	**	7.67	PE	3960
$C_{21}H_{24}^+$	$(C_6)_2(CH_2)_{12}$ [(2.2.2.2.2.2)(1,2,3,4,5,6)Cyclophane]	XXXXXX-XX-X	**	7.55±0.02 (V)	PE	5600
$C_{25}H_{16}^+$	$C_{25}H_{16}$ (9,9'-Spiro[9H-fluorene])	159-66-0	**	7.7 (V)	PE	4081
$C_{26}H_{14}^+$	$C_{26}H_{14}$ (Dibenzo[<i>b,ghi</i>]perylene)	5869-30-7	**	6.99 (V)	PE	4712
	$C_{26}H_{14}$ (Dibenzo[<i>b,pqr</i>]perylene)	190-95-4	**	7.12 (V)	PE	4712
	$C_{26}H_{14}$ (Dibenzo[<i>cd,lm</i>]perylene)	188-96-5	**	6.72±0.02 (V)	PE	4852
			**	6.77±0.04	PE	4196
	$C_{26}H_{14}$ (Naphtho[1,2,3,4- <i>ghi</i>]perylene)	190-84-1	**	6.96 (V)	PE	4712
	$C_{26}H_{14}$ (Naphtho[8,1,2- <i>bcd</i>]perylene)	188-89-6	**	6.82±0.04	PE	4196
$C_{26}H_{16}^+$	$C_{26}H_{16}$ (Benzo[<i>c</i>]picene)	217-37-8	**	7.36±0.02 (V)	PE	4913
	$C_{26}H_{16}$ (Benzo[<i>a</i>]pentacene)	239-98-5	**	6.61±0.02 (V)	PE	4913
			**	6.72±0.04	PE	4196
	$C_{26}H_{16}$ (Benzo[<i>c</i>]pentaphene)	222-54-8	**	7.14±0.04	PE	4196
			**	7.20±0.02 (V)	PE	4913
	$C_{26}H_{16}$ (Benzo[<i>h</i>]pentaphene)	214-91-5	**	7.30±0.04	PE	4196
			**	7.36±0.02 (V)	PE	4913
	$C_{26}H_{16}$ (Benzo[<i>b</i>]picene)	217-42-5	**	7.17±0.02 (V)	PE	4913
			**	7.20±0.04	PE	4196
	$C_{26}H_{16}$ (Benzo[<i>c</i>]picene)	217-37-8	**	7.20 (V)	PE	4701
	$C_{26}H_{16}$ (Dibenzo[<i>a,j</i>]naphthacene)	227-04-3	**	6.99±0.02 (V)	PE	4913
	$C_{26}H_{16}$ (Dibenzo[<i>b,k</i>]chrysene)	217-54-9	**	6.97±0.04	PE	4196
			**	6.98±0.02 (V)	PE	4913
	$C_{26}H_{16}$ (Dibenzo[<i>g,p</i>]chrysene)	191-68-4	**	7.18±0.04	PE	4196

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{26}H_{16}^+$	$C_{26}H_{16}$	191-68-4	**	7.20 ± 0.02 (V)	PE	4913
	$C_{26}H_{16}$	216-00-2	**	6.96 ± 0.04	PE	4196
	(Dibenzo[<i>a,c</i>]naphthacene)		**	6.98 ± 0.02 (V)	PE	4913
	$C_{26}H_{16}$	227-04-3		7.02 ± 0.04	PE	4196
	(Dibenzo[<i>a,y</i>]naphthacene)					
	$(C_{13}H_8)_2$	746-47-4	**	7.27 ± 0.04	PE	4196
	(9 <i>H</i> -Fluorene, 9(9 <i>H</i> -fluoren-9-ylidene)-)					
	$C_{26}H_{16}$	258-31-1	**	6.36 ± 0.02 (V)	PE	4913
	(Hexacene)					
	$C_{26}H_{16}$	222-78-6	**	6.44 ± 0.04	PE	4196
	(Hexaphene)		**	6.92 ± 0.02 (V)	PE	4913
	$C_{26}H_{16}$	220-77-9	**	7.02 ± 0.04	PE	4196
	(Naphtho[1,2- <i>b</i>]chrysene)		**	7.19 ± 0.02 (V)	PE	4913
	$C_{26}H_{16}$	196-64-5	**	7.15 ± 0.02 (V)	PE	4913
	(Naphtho[2,3- <i>g</i>]chrysene)					
	$C_{26}H_{16}$	220-82-6	**	7.15 ± 0.04	PE	4196
	(Naphtho[2,1- <i>a</i>]naphthacene)		**	7.22 ± 0.04	PE	4196
	$C_{26}H_{16}$	187-83-7	**	6.83 ± 0.02 (V)	PE	4913
	(Phenanthro[3,4- <i>c</i>]phenanthrene)		**	7.37 (V)	PE	4488
	$C_{26}H_{16}$	215-26-9	**	7.35 ± 0.04	PE	4196
	(Tribenz[<i>a,c,h</i>]anthracene)					
			**	7.40 ± 0.02 (V)	PE	4913
			**	7.40 (V)	PE	4701
$C_{26}H_{24}^+$	$(C_6H_5CHCHCHCHCHCHCHCH)_2$	62622-57-5	**	7.2 ± 0.2	PE	5124
	(Benzene, 1,1'-(1,3,5,7,9,11,13-tetradecaheptaene-1,14-diyl)bis-)					
$C_{28}H_{14}^+$	$C_{28}H_{14}$	190-70-5	**	7.08 (V)	PE	4701
	(Benzo[<i>a</i>]coronene)		**	7.08 (V)	PE	4712
	$C_{28}H_{14}$	190-71-6	**	6.92 ± 0.04	PE	4196
	(Benzo[<i>pqr</i>]naphtho[8,1,2- <i>bcd</i>]perylene)					
	$C_{28}H_{14}$	190-39-6	**	6.30 (V)	PE	4712
	(Phenanthro[1,10,9,8- <i>opqr</i>]perylene)					
$C_{28}H_{16}^+$	$C_{28}H_{16}$	385-14-8	**	7.00 ± 0.04	PE	4196
	(Benzo[<i>p</i>]naphtho[1,8,7- <i>ghi</i>]chrysene)					
	$C_{28}H_{16}$	14147-38-7	**	6.82 (V)	PE	4712
	(Dibenzo[<i>de,st</i>]pentacene)					
	$C_{28}H_{16}$	193-11-3	**	7.03 ± 0.04	PE	4196
	(Dibenzo[<i>de,uv</i>]pentacene)					
	$C_{28}H_{16}$	197-74-0	**	6.86 (V)	PE	4712
	(Dibenzo[<i>fg,gr</i>]pentacene)					
	$C_{28}H_{16}$	192-59-6	**	7.33 ± 0.04	PE	4196
	(Dibenzo[<i>fg,st</i>]pentacene)					
	$C_{28}H_{16}$	197-69-3	**	6.85 (V)	PE	4712
	(Dibenzo[<i>fg,ij</i>]pentaphene)					
	$C_{28}H_{16}$	190-36-3	**	6.51 (V)	PE	4712
	(Dibenzo[<i>a,o</i>]perylene)					
	$C_{28}H_{16}$	191-81-1	**	6.64 (V)	PE	4712
	(Dibenzo[<i>a,n</i>]perylene)					
	$C_{28}H_{16}$	191-87-7	**	6.51 (V)	PE	4712
	(Dibenzo[<i>a,y</i>]perylene)					

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{28}H_{16}^+$	$C_{28}H_{16}$ (Naphtho[1,2,3,4- <i>rst</i>]pentaphene)	191-20-8	**	7.09 ± 0.04	PE	4196
$C_{28}H_{20}^+$	$C_{28}H_{20}$ (Azulene, 1,2,3-triphenyl-)	XXXXX-XX-X	**	6.9 (V)	PE	5397
$C_{28}H_{31}^+$	$(C_6H_2(CH_3)_{3/4})CH$ (Benzene, 1,1',1''-methylidynetris[2,4,6-trimethyl-])	52719-55-8	**	7.68 ± 0.05 (V)	PE	4620
$C_{30}H_{14}^+$	$C_{30}H_{14}$ (Dibenzo[<i>bc,ef</i>]coronene)	190-31-8	**	6.50 (V)	PE	4712
	$C_{30}H_{14}$ (Dibenzo[<i>bc,kl</i>]coronene)	190-55-6	**	6.42 ± 0.02 (V)	PE	4852
$C_{30}H_{16}^+$	$C_{30}H_{16}$ (Anthra[1,2,3,4- <i>ghi</i>]perylene)	190-85-2	**	6.77 (V)	PE	4712
	$C_{30}H_{16}$ (Benzo[<i>st</i>]naphtho[2,1,8,7- <i>defg</i>]pentacene)	14258-76-5	**	7.04 (V)	PE	4712
	$C_{30}H_{16}$ (Benzo[<i>uv</i>]naphtho[2,1,8,7- <i>defg</i>]pentacene)	5869-31-8	**	6.78 (V)	PE	4712
	$C_{30}H_{16}$ (Benzo[<i>qr</i>]naphtho[2,1,8,7- <i>fghi</i>]pentacene)	190-87-4	**	6.97 (V)	PE	4712
	$C_{30}H_{16}$ (Tetrabenzo[<i>de,hi,mn,qr</i>]naphthacene)	385-13-7	**	6.90 ± 0.04	PE	4196
	$C_{30}H_{16}$ (Tribenzo[<i>de,kl,rst</i>]pentaphene)	188-72-7	**	6.42 ± 0.02 (V)	PE	4852
	$C_{30}H_{16}$ (Tribenzo[<i>b,n,pqr</i>]perylene)	190-81-8	**	7.13 (V)	PE	4701
			**	7.13 (V)	PE	4712
$C_{30}H_{18}^+$	$C_{30}H_{18}$ (Benzo[<i>p</i>]hexaphene)	222-81-1	**	6.59 ± 0.02 (V)	PE	4913
	$C_{30}H_{18}$ (Benzo[<i>c</i>]naphtho[2,1- <i>p</i>]chrysene)	27798-46-5	**	7.19 ± 0.02 (V)	PE	4913
	$C_{30}H_{18}$ (Dibenzo[<i>a,c</i>]pentacene)	216-08-0	**	6.62 ± 0.02 (V)	PE	4913
			**	6.67 ± 0.04	PE	4196
	$C_{30}H_{18}$ (Dibenzo[<i>a,l</i>]pentacene)	227-09-8	**	6.64 ± 0.02 (V)	PE	4913
	$C_{30}H_{18}$ (Dibenzo[<i>c,m</i>]pentaphene)	222-51-5	**	7.11 ± 0.02 (V)	PE	4913
			**	7.11 (V)	PE	4701
	$C_{30}H_{18}$ (Dibenzo[<i>b,n</i>]picene)	213-44-5	**	7.17 ± 0.02 (V)	PE	4913
	$C_{30}H_{18}$ (Dinaphtho[2,1- <i>c</i> :1',2'- <i>g</i>]phenanthrene)	16914-68-4	**	7.25 (V)	PE	4488
	$C_{30}H_{18}$ (Heptaphene)	222-75-3	**	6.89 ± 0.02 (V)	PE	4913
			**	6.98 ± 0.04	PE	4196
	$C_{30}H_{18}$ (Naphtho[2,3- <i>c</i>]pentaphene)	222-58-2	**	7.04 ± 0.02 (V)	PE	4913
	$C_{30}H_{18}$ (Tetrabenz[<i>a,c,h,j</i>]anthracene)	215-11-2	**	7.43 ± 0.02 (V)	PE	4913
			**	7.43 (V)	PE	4701
			**	7.45 ± 0.04	PE	4196
	$C_{30}H_{18}$ (Tribenz[<i>a,c,j</i>] naphthacene)	215-96-3	**	6.99 ± 0.02 (V)	PE	4913

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{30}H_{18}^+$	$C_{30}H_{18}$ (Trinaphthylene)	196-62-3	**	7.35 ± 0.02 (V)	PE	4913
$C_{32}H_{14}^+$	$C_{32}H_{14}$ (Ovalene)	190-26-1	**	6.71 (V)	PE	4712
			**	6.86 ± 0.01	PE	3644
$C_{32}H_{16}^+$	$C_{32}H_{16}$ (Dibenzo[<i>a,g</i>]coronene)	190-66-9	**	7.04 (V)	PE	4712
			**	7.04 (V)	PE	4701
	$C_{32}H_{16}$ (Dibenzo[<i>a,j</i>]coronene)	190-72-7	**	6.92 (V)	PE	4712
			**	6.92 (V)	PE	4701
	$C_{32}H_{16}$ (Naphtho[2,3- <i>a</i>]coronene)	190-74-9	**	6.88 (V)	PE	4712
$C_{32}H_{18}^+$	$C_{32}H_{18}$ (Dibenzo[<i>fg,wx</i>]hexacene)	192-60-9	**	7.01 ± 0.04	PE	4196
	$C_{32}H_{18}$ (Dibenzo[<i>hi,uv</i>]hexacene)	192-54-1	**	7.30 ± 0.04	PE	4196
$C_{31}H_{16}^+$	$C_{31}H_{16}$ (Benzo[<i>pqr</i>]dinaphtho[8,1,2- <i>bcd</i> :2',1',8'- <i>lmn</i>]perylene)	188-11-4	**	6.74 ± 0.02 (V)	PE	4852
	$C_{31}H_{16}$ (Dibenzo[<i>fg,ij</i>]phenanthro[2,1,10,9,8,7- <i>pqrstuv</i>]pentaphene)	187-94-0	**	6.82 ± 0.02 (V)	PE	4852
			**	6.82 (V)	PE	4712
$C_{31}H_{18}^+$	$C_{31}H_{18}$ (Benzo[<i>rst</i>]phenanthro[1,10,9- <i>cde</i>]pentaphene)	190-93-2	**	6.42 ± 0.02 (V)	PE	4852
	$C_{31}H_{18}$ (Dibenzo[<i>a,rst</i>]naphtho[8,1,2- <i>cde</i>]pentaphene)	191-46-8	**	6.59 ± 0.02 (V)	PE	4852
	$C_{31}H_{18}$ (Dibenzo[<i>fg,ij</i>]naphtho[1,2,3,4- <i>rst</i>]pentaphene)	313-63-3	**	6.84 (V)	PE	4712
	$C_{31}H_{18}$ (Dibenzo[<i>m,pqr</i>]naphtho[1,2,3,4- <i>tuv</i>]picene)	XXXXXX-XX-X	**	6.59 ± 0.02 (V)	PE	4852
	$C_{31}H_{18}$ (Tetrabenzo[<i>de,hi,op,st</i>]pentacene)	191-79-7	**	6.27 ± 0.02 (V)	PE	4852
	$C_{31}H_{18}$ (Tetrabenzo[<i>de,h,kl,rst</i>]pentaphene)	188-13-6	**	6.22 ± 0.02 (V)	PE	4852
	$C_{31}H_{18}$ (Tetrabenzo[<i>a,cd,j,lm</i>]perylene)	191-53-7	**	6.71 ± 0.02 (V)	PE	4852
	$C_{31}H_{18}$ (Tetrabenzo[<i>c,m,pqr,tuv</i>]picene)	XXXXXX-XX-X	**	6.48 ± 0.02 (V)	PE	4852
$C_{31}H_{20}^+$	$C_{31}H_{20}$ (Benz[<i>j</i>]heptaphene)	214-87-9	**	6.90 ± 0.02 (V)	PE	4913
	$C_{31}H_{20}$ (Benzo[<i>a</i>]phenanthro[9,10- <i>c</i>]naphthacene)	385-16-0	**	6.73 ± 0.02 (V)	PE	4913
	$C_{31}H_{20}$ (Naphtho[2,1- <i>c</i>]phenanthro[4,3- <i>g</i>]phenanthrene)	20495-12-9	**	7.15 (V)	PE	4488
	$C_{31}H_{20}$ (Tetrabenzo[<i>b,g,k,p</i>]chrysene)	385-15-9	**	6.83 ± 0.02 (V)	PE	4913
	$C_{31}H_{20}$ (Tetrabenzo[<i>a,c,j,l</i>]naphthacene)	215-95-2	**	7.00 ± 0.02 (V)	PE	4913
			**	7.00 (V)	PE	4701

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{36}H_{16}^+$	$C_{36}H_{16}$ (Dinaphtho[8,1,2- <i>abc</i> :2',1',8'- <i>klm</i>]coronene)	53086-28-5	**	6.76±0.02 (V)	PE	4852
			**	6.85±0.04	PE	4196
	$C_{36}H_{16}$ (Dinaphtho[8,1,2- <i>abc</i> :8',1',2'- <i>jkl</i>]coronene)	190-47-6	**	6.70±0.04	PE	4196
$C_{36}H_{18}^+$	$C_{36}H_{18}$ (Dibenzo[<i>g,i</i>]phenanthro[9,10,1,2,3- <i>pqrst</i>]pentaphene)	188-00-1	**	7.10 (V)	PE	4701
	$C_{36}H_{18}$ (Tribenzo[<i>a,d,g</i>]coronene)	313-62-2	**	6.88 (V)	PE	4712
			**	6.88 (V)	PE	4701
$C_{36}H_{20}^+$	$C_{36}H_{20}$ (Dibenzo[<i>hi,wx</i>]heptacene)	197-73-9	**	6.68 (V)	PE	4712
	$C_{36}H_{20}$ (Dinaphtho[1,2,3- <i>fg</i> :1',2',3'- <i>qr</i>]pentacene)	36474-85-8	**	6.82 (V)	PE	4712
$C_{38}H_{16}^+$	$C_{38}H_{16}$ (Naphth[2',1',8',7':4,10,5]anthra[1,9,8- <i>abcd</i>]coronene)	41163-25-1	**	6.81±0.02 (V)	PE	4852
			**	6.90 (V)	PE	4701
$C_{38}H_{18}^+$	$C_{38}H_{18}$ (Benzo[<i>rs</i>]dinaphtho[2,1,8,7- <i>klmn</i> :3',2',1',8',7'- <i>vwxyz</i>]hexaphene)	190-90-9	**	6.38±0.02 (V)	PE	4852
	$C_{38}H_{18}$ (Dibenzo[<i>jk,uv</i>]dinaphtho[2,1,8,7- <i>defg</i> :2',1',8',7'- <i>opqr</i>]pentacene)	190-89-6	**	6.50±0.02 (V)	PE	4852
$C_{38}H_{20}^+$	$C_{38}H_{20}$ (Benzo[<i>wx</i>]naphtho[2,1,8,7- <i>hijk</i>]heptacene)	14529-73-8	**	6.72 (V)	PE	4712
	$C_{38}H_{20}$ (Tribenzo[<i>fg,mn,xyz</i>]heptaphene)	34814-77-2	**	6.40±0.02 (V)	PE	4852
	$C_{38}H_{20}$ (Tribenzo[<i>de,h,kl</i>]naphtho[1,2,3,4- <i>rst</i>]pentaphene)	187-96-2	**	6.06±0.02 (V)	PE	4852
$C_{38}H_{22}^+$	$C_{38}H_{22}$ (Diphenanthro[3,4- <i>c</i> :4'3'- <i>g</i>]phenanthrene)	20495-14-1	**	7.07 (V)	PE	4488
	$C_{38}H_{22}$ (Tetrabenz[<i>a,c,l,n</i>]pentacene)	216-07-9	**	6.65±0.02 (V)	PE	4913
$C_{38}H_{56}^+$	($C_6H_6(CH_3)_3(CHCHC(CH_3)_2CH)_2$ (β -Carotene,(all-E)-1,1-(3,7,12,16-tetramethyl-1,3,5,7,9,11,13,15,17-octadecanonaene-1,18-diyl)bis[2,6,6-trimethylcyclohexene])	7235-40-7		6.4±0.2	OTH	5278
$C_{40}H_{20}^+$	$C_{40}H_{20}$ (Benzo[1,2,3- <i>cd</i> :4,5,6- <i>c'd</i>]diperylene)	188-73-8	**	6.11±0.02 (V)	PE	4852
$C_{40}H_{56}^+$	$C_{40}H_{56}$ (1,3,5,7,9,11,13,15,17-Octadecanonene,3,7,12,16-tetramethyl-1,18-cyclohex-1-ene,2,6,6-trimethyl-)	XXXXX-XX-X	**	6.5	PE	5093
$C_{42}H_{18}^+$	$C_{42}H_{18}$ (Hexabenz[<i>bc,ef,hi,kl,no,qr</i>]coronene)	190-24-9	**	6.87±0.02 (V)	PE	4852
			**	6.87 (V)	PE	4712

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{12}H_{18}^+$	$C_{12}H_{18}$	190-24-9	**	6.89 (V)	PE	4701
$C_{12}H_{20}^+$	$C_{12}H_{20}$ (Dibenzo[<i>fg,mn</i>]phenanthro[2,1,10,9,8,7- <i>vwxyz</i> , <i>a,b</i>]heptaphene)	34814-80-7	**	6.72 ± 0.02 (V)	PE	4852
$C_{12}H_{22}^+$	$C_{12}H_{22}$ (Dibenzo[<i>fg,mn</i>]naphtho[1,2,3,4- <i>xyz</i>]heptaphene)	34814-82-9	**	6.18 ± 0.02 (V)	PE	4852
	$C_{12}H_{22}$ (Hexabenzo[<i>a,cd,fj,lm,o</i>]perylene)	190-22-7	**	6.71 ± 0.02 (V)	PE	4852
$C_{12}H_{24}^+$	$C_{12}H_{24}$ (Anthra[2,3- <i>j</i>]heptaphene)	214-77-7	**	6.85 ± 0.02 (V)	PE	4913
	$C_{12}H_{24}$ (Benzo[<i>g</i>]phenanthro[3,4- <i>c</i> :6,5- <i>c'</i>]diphenanthrene)	57520-29-3	**	6.99 (V)	PE	4488
	$C_{12}H_{24}$ (Dibenzo[<i>fj</i>]phenanthro[9,10- <i>s</i>]picene)	190-23-8	**	7.52 ± 0.02 (V)	PE	4913
$C_{12}H_{30}^+$	$C_6(C_6H_5)_6$ (Benzene, hexaphenyl-)	XXXXX-XX-X	**	8.47 ± 0.05	EI	4628
	$C_{12}H_{30}$ (Cyclopropene, bis-3,3'-triphenyl-)	XXXXX-XX-X	**	7.72 ± 0.05	EI	4628
$C_{11}H_{20}^+$	$C_{11}H_{20}$ (Dibenzo[<i>ajk</i>]phenanthro[8,9,10,1,2- <i>cdefgh</i>]pyranthrene)	70346-75-7	**	6.79 ± 0.02 (V)	PE	4852
$C_{16}H_{26}^+$	$C_{16}H_{26}$ (Bisbenzo[5,6]phenanthro[3,4- <i>c</i> :4',3'- <i>g</i>]phenanthrene)	57468-45-8	**	6.95 (V)	PE	4488
	$C_{16}H_{26}$ (Tetrabenzo[<i>a,c,g,s</i>]heptaphene)	62662-49-1	**	6.88 ± 0.02 (V)	PE	4913
$C_{18}H_{24}^+$	$C_{18}H_{24}$ (Hexabenzo[<i>a,d,g,j,m,p</i>]coronene)	1065-80-1	**	6.75 (V)	PE	4712
			**	6.78 (V)	PE	4701
$C_{30}H_{28}^+$	$C_{30}H_{28}$ (Dinaphtho[1,2- <i>g</i> :1',2'- <i>g'</i>]naphtho[2,1- <i>c</i> :7,8- <i>c'</i>]diphenanthrene)	57468-46-9	**	6.93 (V)	PE	4488
$C_{34}H_{30}^+$	$C_{34}H_{30}$ (Bisnaphtho[1',2':5,6]phenanthro[3,4- <i>c</i> :4',3'- <i>g</i>]phenanthrene)	24386-06-9	**	6.91 (V)	PE	4488
$C_{38}H_{32}^+$	$C_{38}H_{32}$ (Diphenanthro[4,3- <i>g</i> :4',3'- <i>g'</i>]naphtho[2,1- <i>c</i> :7,8- <i>c'</i>]diphenanthrene)	57483-71-3	**	6.88 (V)	PE	4488
Li_3C^+	CLi_3	70378-93-7	**	4.6 ± 0.3	EI	5334
$LiCH_3^+$	$(tert-C_4H_9)_3Li_1$	25395-78-2		11.0 ± 0.50	PI	5455
$Li_2C_4H_3^+$	$(tert-C_4H_9)_3Li_1$	25395-78-2		8.1 ± 0.25	PI	5455

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$\text{Li}_1\text{C}_4\text{H}_9^+$	$(\text{tert-C}_4\text{H}_9)_3\text{Li}_1$	25395-78-2		8.1 ± 0.25	PI	5455
$\text{Li}_1\text{C}_8\text{H}_{18}^+$	$(\text{tert-C}_4\text{H}_9)_3\text{Li}_1$	25395-78-2		8.1 ± 0.25	PI	5455
$\text{Li}_1\text{C}_{12}\text{H}_{27}^+$	$(\text{tert-C}_4\text{H}_9)_3\text{Li}_1$	25395-78-2		6.2 ± 0.25	PI	5455
$\text{Li}_1\text{C}_{16}\text{H}_{36}^+$	$(\text{tert-C}_4\text{H}_9)_3\text{Li}_1$	25395-78-2	**	6.2 ± 0.25	OTH	5455
BeC_6H_5^+	$(\text{C}_6\text{H}_5)_2\text{Be}$ (Beryllium, diphenyl-)	22300-89-6	C_6H_5	13.4 ± 0.2	EI	3815
BeC_6H_8^+	$(\text{C}_3\text{H}_5)(\text{CH}_3)\text{Be}$ (Beryllium, $(\eta^5-2,4\text{-cyclopentadien-1-yl})\text{methyl-}$)	36351-95-8	**	9.43 (V)	PE	5384
BeC_7H_6^+	$(\text{C}_3\text{H}_5)(\text{C}_2\text{H})\text{Be}$ (Beryllium, $(\eta^5-2,4\text{-cyclopentadien-1-yl})\text{ethynyl-}$)	52140-36-0	**	9.40 (V)	PE	5384
BeC_8H_8^+	$(\text{C}_3\text{H}_5)(\text{C}_2\text{CH}_3)\text{Be}$ (Beryllium, $(\eta^5-2,4\text{-cyclopentadien-1-yl})\text{propynyl-}$)	XXXXX-XX-X	**	8.82 (V)	PE	5384
$\text{BeC}_{10}\text{H}_{10}^+$	$(\text{C}_3\text{H}_5)_2\text{Be}$ (Beryllium, $2,4\text{-cyclopentadien-1-yl}(\eta^5-2,4\text{-cyclopentadien-1-yl})\text{-}$)	37048-03-6	**	7.45 (V)	PE	5108
$\text{BeC}_{12}\text{H}_{10}^+$	$(\text{C}_6\text{H}_5)_2\text{Be}$ (Beryllium, diphenyl-)	22300-89-6	**	9.20 ± 0.10	EI	3815
B_5CH_9^+	CH_9B_5 (2-Carbahexaborane(9))	12385-35-2	**	10.4 (V)	PE	4949
$\text{B}_5\text{CH}_{11}^+$	$\text{B}_5\text{H}_8\text{CH}_3$ (Pentaborane(9), 1-methyl-)	19495-55-7	**	10.20 (V)	PE	4519
	$\text{B}_5\text{H}_8\text{CH}_3$ (Pentaborane(9), 2-methyl-)	23753-74-4	**	10.30 (V)	PE	4519
$\text{B}_3\text{C}_2\text{H}_5^+$	$\text{C}_2\text{H}_3\text{B}_3$ (1,5-Dicarapentaborane)	20693-66-7	**	10.54	PE	4446
			**	10.9 (V)	PE	4949
$\text{B}_1\text{C}_2\text{H}_6^+$	$\text{C}_2\text{H}_6\text{B}_1$ (1,6-Dicarbahexaborane(6))	20693-67-8	**	9.9 (V)	PE	4949
			**	9.77	PE	4446
$\text{B}_1\text{C}_2\text{H}_8^+$	$\text{C}_2\text{H}_8\text{B}_1$ (2,3-Dicarbahexaborane(8))	18972-20-8	**	9.6 (V)	PE	4949
$\text{B}_5\text{C}_2\text{H}_7^+$	$\text{C}_2\text{H}_7\text{B}_5$ (2,4-Dicarbaheptaborane(7))	20693-69-0	**	10.54	PE	4446

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$B_3C_2H_7^+$	$C_2H_7B_3$	20693-69-0	**	10.6 (V)	PE	4949
$B_8C_2H_{10}^+$	$C_2B_8H_{10}$ (1,10-Dicarbadeccaborane(10))	23653-23-8	**	10.5 (V)	PE	5324
$B_{10}C_2H_{12}^+$	$C_2B_{10}H_{12}$ (1,12-Dicarbadeccaborane(12))	20644-12-6	**	10.6 (V)	PE	5324
	$C_2H_{12}B_{10}$ (1,7-Dicarbadeccaborane)	16986-24-6	**	10.19	PE	4446
$BC_3H_9^+$	$(CH_3)_3B$	593-90-8	** ** **	10.68 (V) 10.69 (V) 10.69	PE PE PE	4398 4243 5485
$BC_{12}H_{10}^+$	$(C_6H_5)_3B$ (Borane, triphenyl-)	960-71-4	C_6H_5	10.2	PI	4055
$BC_{11}H_{19}^+$	$C_6H_5BC_9H_{14}$ (9-Borabicyclo[3.3.1]nonane, 9-phenyl-)	23418-91-9	**	9.16 (V)	PE	4956
$BC_{18}H_{15}^+$	$(C_6H_5)_3B$ (Borane, triphenyl-)	960-71-4	**	8.60 ± 0.03	PI	4055
N^+	N	17778-88-0	**	14.549	PI	4355
	N_2	7727-37-9	**	24.3	EI	5617
			$N(^4S^o)$	24.34	EI	5051
			N	24.4 ± 0.25	EI	3797
	NH_3	7664-41-7	$H_2 + H$	≤ 22.5	EI	3811
	N_2O	10024-97-2	NO	20 ± 1	PI	5170
			NO	19.494	PE	4752
N^{+2}	N_2	7727-37-9	N	60.3 ± 2	EI	3797
N_2^+	N_2	7727-37-9	**	15.5812 ± 0.002	S	3561
	$(^2\Sigma_g^-)$		**	15.5	PI	5479
	$(^2\Pi_u)$		**	16.7	PI	5479
	$(^2\Sigma_g^-)$		**	18.8	PI	5479
	$(^2\Sigma_g^-)$		**	15.58	PE	4248
	$(^2\Sigma_g^-)$		**	15.58 (V)	PE	5055
	$(^2\Sigma_g^-)$		**	15.60 (V)	PE	4022
	$(^2\Sigma_g^-)$		**	15.61	PE	4073
	$(A^2\Pi_u)$		**	16.695 ± 0.002	PE	3935
	$(^2\Pi_u)$		**	16.70	PE	4248
	$(^2\Pi_u)$		**	16.73	PE	4073
	$(^2\Pi_u)$		**	16.98 (V)	PE	4022
	$(^2\Sigma_u^-)$		**	18.75	PE	4248
	$(^2\Sigma_u^-)$		**	18.78 (V)	PE	4022
	$(^2\Sigma_u^-)$		**	18.87 (V)	PE	3714
	$(^2\Sigma_u^-)$		**	24.6 (V)	PE	3714

Table of Ion Energetics Measurements—Continued.

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
N_2^+ ($^2\Pi_g$) ($^2\Sigma_g^-$) ($^2\Sigma_g^-$) ($^2\Sigma_g^-$) ($^2\Sigma_g^-$) ($^2\Sigma_g^-$) ($^2\Sigma_g^-$)	N_2	7727-37-9	**	29.0 (V)	PE	4615
			**	35 (V)	PE	3714
			**	39.8 (V)	PE	4615
			**	28-29 (V)	PE	3714
			**	32-33 (V)	PE	3714
			**	36-37 (V)	PE	3714
			**	15.58±0.02	EI	4877
	N_2H_2	3618-05-1	H_2	61.1±0.5	EI	5346
	<i>iso</i> - N_2H_2	28647-38-3	H_2	14.00±0.05	EI	4896
	N_2O	10024-97-2	O	13.70±0.05	EI	5248
N_2^{+2} ($^1\Sigma_g^+$) ($^1\Pi_u$)	N_2	7727-37-9	**	18±1	PI	5170
			**	43	EI	3452
			**	43.1±0.5	OTH	5007
	N_2^+	13966-04-6	**	45.2±0.5	OTH	5007
				28	EI	3452
HN^+ ($^2\Pi$)	NH	XXXXX-XX-X	**	13.49±0.01 (V)	PE	5011
	NH_3	7664-41-7	H_2	17.2	EI	3811
H_2N^+ (3B_1) (1A_1) (1B_1)	NH_2	15194-15-7	**	11.46±0.01	PE	5011
			**	12.45±0.01	PE	5011
			**	14.27±0.01 (V)	PE	5011
	NH_3	7664-41-7	**	15.768±0.004	PI	5146
			H	15.0	EI	3811
	CH_3NH_2	74-89-5	CH_3	15.9	EI	3808
HDN^+	NH_2D	13587-49-0	**	15.79±0.01	PI	5146
	NHD_2	13780-28-4	**	15.90±0.01	PI	5146
D_2N^+	ND_2	54842-55-6	**	11.45±0.01	PE	5011
	NHD_2	13780-28-4	**	15.79±0.01	PI	5146
	ND_3	13550-49-7	**	15.89±0.01	PI	5146
H_3N^+	NH_3	7664-41-7	**	10.18±0.09	PE	4497
			**	10.15	PE	3719
			**	10.2	PE	4623
			**	10.85 (V)	PE	5540
			**	11.3 (V)	PE	4845
			**	10.2	EI	3811
			**	10.45	EI	4759
			**	10.10±0.05	PI	4592
	NH_4Cl	12125-02-9				
H_3N^{+2}	NH_3	7664-41-7	**	35.3±0.7	OTH	5266
D_3N^+	ND_3	13550-49-7	**	10.21	PE	3719
H_1N^+	$C_2H_5NH_2$	75-04-7	$C_2H_2 + H$	12.72±0.02	EI	3487
	$(CH_3)_2NH$	124-40-3		14.05±0.05	EI	3487
	NH_4Cl	12125-02-9	Cl	10.10±0.05	PI	4592

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
HN_2^+	N_3H	36882-13-0		7.8 ± 0.05	EI	5248
	N_2H_2	3618-05-1	H	10.98 ± 0.05	EI	4896
			H	11.33 ± 0.05	EI	5248
	N_2H_2	15626-43-4	H	10.89 ± 0.08	EI	4903
	<i>iso</i> - N_2H_2	28647-38-3	H	10.77 ± 0.05	EI	5248
H_2N_2^+	N_2H_2	3618-05-1	**	9.59 ± 0.01	PE	4587
			**	9.59	PE	4408
			**	9.59	PE	5137
			**	9.7 ± 0.1	EI	4896
				9.80 ± 0.05	EI	5248
	<i>iso</i> - N_2H_2	28647-38-3		9.52 ± 0.05	EI	5248
	<i>trans</i> - N_2H_2	15626-42-3	**	9.65 ± 0.08	EI	4904
	N_2H_4	302-01-2	2H	10.75 ± 0.08	EI	4904
D_2N_2^+	N_2D_2	14989-24-3	**	9.61	PE	4408
			**	9.61	PE	5137
	N_2D_2	40712-39-8	**	9.61 ± 0.01	PE	4587
H_3N_2^+	N_2H_3	13598-46-4		7.85 ± 0.05	EI	5248
	N_2H_4	302-01-2	H	10.86 ± 0.05	EI	5248
H_4N_2^+	N_2H_4	302-01-2	**	8.98 ± 0.05	PE	4521
			**	9.90 (V)	PE	4137
			**	9.91 (V)	PE	3862
			**	10.07	PE	3747
			**	10.68 (V)	PE	5381
				8.93 ± 0.05	EI	5248
HN_3^+	HN_3	7782-79-8	**	10.70	PE	4500
	($^2\text{A}''$)		**	10.72 ± 0.02	PE	3670
			**	10.72 (V)	PE	5151
			**	10.74	PE	4595
	($^2\text{A}'$)		**	12.24 ± 0.02 (V)	PE	3670
H_4N_4^+	<i>trans</i> - $\text{H}_2\text{NN}=\text{NNH}_2$	54410-57-0	**	8.99 (V)	PE	4432
H_6BN^+	$(\text{BH}_3)(\text{NH}_3)$	xxxx-xx-x	**	9.44 ± 0.02	PE	3699
$\text{H}_6\text{B}_3\text{N}_3^+$	$\text{B}_3\text{H}_6\text{N}_3$	6569-51-3	**	9.88	PE	3637
	(Borazine)		**	10.09 (V)	PE	3673
			**	10.14 ± 0.01	PE	3506
CN^+	$((\text{CH}_3)_2\text{C}(\text{CN})\text{NO})_2$	31018-29-8		16.50	EI	4809
	$((\text{CH}_3)_2\text{C}(\text{NO})\text{OOCCH}_3)_2$	68777-98-0		15.90	EI	4809
	PF_2CN	14118-40-2	PF_2	19.8 ± 0.3	EI	4543
C_2N^{2+}	$\text{C}_2\text{H}_5\text{CN}$	107-12-0		41.2	EI	5337

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_2N_2^+$	C_2N_2	460-19-5	**	13.51 (V)	PE	5525
			**	35.5±0.5	OTH	5147
$C_4N_2^+$	$CNC\equiv CCN$	1071-98-3	**	11.84 (V)	PE	4765
			**	11.84 (V)	PE	5525
$C_6N_2^+$	$CNC\equiv CC\equiv CCN$	16419-78-6	**	11.2	S	4254
CN_4^+	$N_4C\equiv N$	764-05-6	**	10.96 (V)	PE	4392
			**	11.00±0.01	PE	4746
$C_5N_4^+$	$C(CN)_4$	24331-09-7		13.94	PE	4417
$C_6N_4^+$	$(NC)_2C=C(CN)_2$	670-54-2	**	11.67±0.02	PI	5505
			**	11.765±0.008	PI	4306
			**	11.79±0.05 (V)	PE	4859
CHN^+	HCN	74-90-8	**	13.60 (V)	PE	5055
			**	13.607±0.002	PE	4525
			**	13.61±0.01	PE	3840
			**	14.00±0.01	PE	3840
			**	14.011±0.003	PE	4525
			**	19.06±0.01	PE	3840
			**	~19.7	PE	4525
			**	31.0 (V)	PE	4525
			**	13.71	EI	3737
	CH_3NH_2	74-89-5		12.5±0.1 (V)	PE	5457
	CH_3NC	75-05-8		12.5±0.1 (V)	PE	5457
	$((CH_3)_2C(CN)NO)_2$	31018-29-8		14.10	EI	4809
DCN^+	DCN	3017-23-0	**	13.613±0.002	PE	4525
			**	13.999±0.003	PE	4525
CH_2N^+	CH_2CHCH_2CN	109-75-1		11.90	PI	5201
	$CH_2C(CH_3)CN$	126-98-7		12.05	PI	5201
	C_3H_5CN	5500-21-0		11.50	PI	5201
	(Cyclopropanecarbonitrile)					
	C_4H_7NH (1H-Pyrrole)	109-97-7		12.40	PI	5201

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
CH_3N^+ ($^2\text{A}'$)	$\text{CH}_2=\text{NH}$	2053-29-4	**	~ 10.0	PE	4489
CH_4N^+	CH_3NH_2	74-89-5		10.55	EI	4878
				10.70	EI	4878
	$(\text{CH}_3)_2\text{NH}$	124-40-3		10.80	EI	4878
	HCONHCH_3	123-39-7		11.65	EI	4878
	$\text{CH}_3\text{CONHCH}_3$	79-16-3		11.50	EI	4878
	$\text{NHCH}_3\text{CONH}_2$	598-50-5		11.65	EI	4878
	$(\text{NHCH}_3)_2\text{CO}$	96-31-1		11.45	EI	4878
	$\text{N}(\text{CH}_3)_2\text{CONHCH}_3$	632-14-4		11.45	EI	4878
	$\text{C}_2\text{H}_5\text{NO}_2$	56-40-6		10.27 ± 0.05	EI	3571
	$\text{NH}(\text{CH}_3)\text{CSNH}_2$	598-52-7		11.10	EI	4878
	$(\text{NHCH}_3)_2\text{CS}$	534-13-4		11.25	EI	4878
	$\text{N}(\text{CH}_3)_2\text{CSNHCH}_3$	2489-77-2		11.60	EI	4878
CH_5N^+	CH_3NH_2	74-89-5	**	8.80 ± 0.02	PE	3890
			**	8.89 ± 0.1	PE	4480
			**	9.08	PE	5510
			**	9.58 (V)	PE	4884
			**	9.58 (V)	PE	5249
			**	9.64 (V)	PE	4068
			**	9.64 (V)	PE	5063
			**	9.65 (V)	PE	4087
			**	9.45	EI	4759
$\text{C}_2\text{H}_2\text{N}^+$	$\text{C}_3\text{H}_4\text{N}_2$ (1 <i>H</i> -Imidazole)	288-32-4	HCN	13.2	EI	3910
	$\text{C}_3\text{H}_3\text{NO}$ (Oxazole)	288-42-6	HCO	14.1	EI	5400
$\text{C}_2\text{H}_3\text{N}^+$	CH_3CN	75-05-8	**	12.20 ± 0.01	PE	4679
			**	12.21 (V)	PE	4884
			**	12.46 (V)	PE	5525
	CH_3NC	593-75-9	**	11.32 (V)	PE	5525
	$\text{CH}_2\text{CHCH}_2\text{CN}$	109-75-1		11.10	PI	5201
	$\text{CH}_2\text{C}(\text{CH}_3)\text{CN}$	126-98-7		11.65	PI	5201
	$\text{C}_3\text{H}_5\text{CN}$ (Cyclopropanecarbonitrile)	5500-21-0		11.00	PI	5201
	$\text{C}_4\text{H}_4\text{NH}$ (1 <i>H</i> -Pyrrole)	109-97-7		11.75	PI	5201
	$\text{C}_3\text{H}_3\text{NO}$ (Oxazole)	288-42-6	CO	11.0	EI	5400
$\text{C}_2\text{H}_4\text{N}^+$	$(\text{CH}_3)_2\text{NCH}=\text{CHC}\equiv\text{CH}$	2206-24-8		13.1	EI	3674
	$(\text{C}_2\text{H}_5)_2\text{NCH}=\text{CHC}\equiv\text{CH}$	1809-53-6		13.6	EI	3674
$\text{C}_2\text{H}_5\text{N}^+$	$\text{CH}_2=\text{NCH}_3$	1761-67-7	**	9.90 ± 0.02 (V)	PE	4776
	$\text{CH}_3\text{CH}=\text{NH}$	20729-41-3	**	10.18 ± 0.02 (V)	PE	4776
	$\text{C}_2\text{H}_5\text{N}$ (Aziridine)	151-56-4	**	9.2 ± 0.1	PE	4990
			**	9.85 ± 0.02 (V)	PE	4133
$\text{C}_2\text{H}_6\text{N}^+$	$\text{C}_2\text{H}_7\text{NH}_2$	75-04-7	H	9.61 ± 0.09	EI	5467
	$(\text{CH}_3)_2\text{NH}$	124-40-3	H	9.41 ± 0.06	EI	5467

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₂H₆N⁺	(CH ₃) ₂ NH	124-40-3		10.50	EI	4878
				10.55	EI	4878
	(CH ₃) ₃ N	75-50-3	CH ₃	10.68±0.09	EI	5467
				11.25	EI	4878
	C ₂ H ₅ NHCH ₃	624-78-2	CH ₃	8.49±0.05	EI	5467
	<i>n</i> -C ₃ H ₇ NH ₂	107-10-8	CH ₃	10.2±0.3	EI	5467
	<i>iso</i> -C ₃ H ₇ NH ₂	75-31-0	CH ₃	8.86±0.05	EI	5467
	(C ₂ H ₅) ₂ NH	109-89-7	C ₂ H ₅	11.42±0.05	EI	5467
	<i>n</i> -C ₄ H ₉ NH ₂	109-73-9	C ₂ H ₅	9.49±0.09	EI	5467
	(CH ₃) ₂ NCH ₂ CH=CH ₂	2155-94-4	C ₃ H ₅	8.58	PI	5543
	(CH ₃) ₃ CH(CH ₂) ₂ NH ₂	107-85-7	<i>iso</i> -C ₃ H ₇	9.59±0.12	EI	5467
	<i>n</i> -C ₇ H ₁₅ NH ₂	110-58-7	C ₃ H ₇	9.34±0.10	EI	5467
	<i>n</i> -C ₈ H ₁₇ NHCH ₃	110-68-9	<i>iso</i> -C ₃ H ₇	8.37±0.06	EI	5467
	(CH ₃) ₂ NCH=CHC≡CH	2206-24-8	CH=CHC≡CH	12.7	EI	3674
	(CH ₃) ₂ NC ₄ H ₉	927-62-8	C ₄ H ₉	9.75±0.10	EI	5467
	C ₂ H ₅ NHC ₄ H ₉	13360-63-9	C ₄ H ₉	8.61±0.05	EI	5467
	<i>tert</i> -C ₄ H ₉ N(CH ₃) ₂	918-02-5	<i>tert</i> -C ₄ H ₉	10.96±0.07	EI	5467
	C ₆ H ₅ CH ₂ N(CH ₃) ₂	28262-13-7	C ₆ H ₅ CH ₂	9.62	PI	5543
	(Benzenemethanamine,dimethyl-)					
	C ₆ H ₅ CH ₂ CH ₂ N(CH ₃) ₂	29088-49-1	C ₆ H ₅ C ₂ H ₄	8.50	PI	5543
	(Benzenethanamine,dimethyl-)					
	CH ₃ C ₆ H ₄ CH ₂ N(CH ₃) ₂	56927-89-0	C ₈ H ₉	9.49	PI	5543
	(Benzenemethanamine,N,N, <i>ar</i> -trimethyl-)					
	HCON(CH ₃) ₂	68-12-2		11.60	EI	4878
	C ₂ H ₅ NHCHO	627-45-2	HCO	9.7±0.15	EI	5467
	CH ₃ CON(CH ₃) ₂	127-19-5		12.15	EI	4878
	N(CH ₃) ₂ CONH ₂	1320-50-9		11.65	EI	4878
	N(CH ₃) ₂ CONHCH ₃	632-14-4		11.70	EI	4878
	((CH ₃) ₂ N) ₂ CO	632-22-4		10.10	EI	4878
	N(CH ₃) ₂ CSNHCH ₃	2489-77-2		10.85	EI	4878
	((CH ₃) ₂ N) ₂ CS	2782-91-4		10.35	EI	4878
C₂H₇N⁺	C ₂ H ₅ NH ₂	75-04-7	**	8.76±0.1	PE	4480
			**	9.44±0.18 (V)	PE	3987
			**	9.471 (V)	PE	4527
			**	9.50 (V)	PE	4032
			**	9.50 (V)	PE	4068
			**	9.50 (V)	PE	5249
			**	8.07	PE	3589
	(CH ₃) ₂ NH	124-40-3	**	8.15±0.1	PE	4480
			**	8.2±0.1	PE	4990
			**	8.25±0.02	PE	3890
			**	8.30	PE	5510
			**	8.85 (V)	PE	4588
			**	8.929 (V)	PE	4527
			**	8.95 (V)	PE	5540
			**	8.97 (V)	PE	5063
			**	8.83	EI	4759
C₃HN⁺	CH≡CCN	1070-71-9	**	11.6	S	3755
			**	11.64±0.01	PI	3929
			**	11.75 (V)	PE	5525
C₃H₂N⁺	CH ₂ CHCH ₂ CN	109-75-1		12.05	PI	5201
	CH ₂ C(CH ₃)CN	126-98-7		12.20	PI	5201
	C ₃ H ₃ CN	5500-21-0		11.75	PI	5201
	(Cyclopropanecarbonitrile)					
	C ₄ H ₇ NH	109-97-7		12.50	PI	5201
	(1H-Pyrrole)					

Table of Ion Energetics Measurements—Continued

[illegible]

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₄H₃N⁺	CH ₂ =C=CHCN	1001-56-5	**	10.35 (V)	PE	4748
	CH ₃ C≡CCN	13752-78-8	**	10.78±0.02	PE	4765
			**	10.95 (V)	PE	5525
	(CH ₃) ₂ NCH=CHC≡CH	2206-24-8	2CH ₃	15.1	EI	3674
	C ₄ H ₈ NCH=CHC≡CH (Pyrrolidine, 1-(1-buten-3-ynyl)-)	19352-85-3	C ₄ H ₈	15.3	EI	3674
	(C ₂ H ₅) ₂ NCH=CHC≡CH	1809-53-6		16.5	EI	3674
C₄H₄N⁺	CH ₂ CHCH ₂ CN	109-75-1	H	12.30	PI	5201
	CH ₂ C(CH ₃)CN	126-98-7	H	12.55	PI	5201
	C ₃ H ₅ CN	5500-21-0	H	12.10	PI	5201
	(Cyclopropanecarbonitrile)					
	C ₄ H ₄ NH (1H-Pyrrole)	109-97-7	H	12.85	PI	5201
C₄H₅N⁺	CH ₂ CHCH ₂ CN	109-75-1	**	10.22	PE	5201
	CH ₂ C(CH ₃)CN	126-98-7	**	10.34	PE	5201
			**	10.37±0.02 (V)	PE	4609
			**	10.37±0.05 (V)	PE	4859
	<i>trans</i> -CH ₃ CH=CHCN	627-26-9	**	10.23±0.05 (V)	PE	4859
	C ₃ H ₅ CN	5500-21-0	**	10.25	PE	5201
	(Cyclopropanecarbonitrile)					
	C ₄ H ₄ NH (1H-Pyrrole)	109-97-7	**	8.207±0.003	PI	5430
			**	8.208±0.005	PI	5274
			**	8.20±0.01	PI	4058
			**	8.23 (V)	PE	4009
			**	8.21	PE	5201
			**	~8.1	EI	4656
			**	8.22±0.05	EI	4316
			**	8.40±0.05	EI	3482
C₄H₆N⁺	(CH ₃) ₂ CC≡N	3225-31-8	**	8.56±0.06 (V)	PE	4609
	<i>tert</i> -C ₄ H ₉ CN	630-18-2		12.5	EI	4809
	((CH ₃) ₂ C(CN)NO) ₂	31018-29-8		9.00	EI	4809
C₄H₇N⁺	C ₄ H ₇ N (1H-Pyrrole, 2,5-dihydro-)	109-96-6	**	8.61±0.05 (V)	PE	4830
C₄H₈N⁺	(CH ₃) ₂ NCH ₂ CH=CH ₂	2155-94-4	CH ₃	9.62	PI	5543
C₄H₉N⁺	CH ₃ CH=NC ₂ H ₅	1190-79-0	**	9.440 (V)	PE	4527
	C ₂ H ₅ N(CH ₃) ₂ (Aziridine, 2,2-dimethyl-)	2658-24-4	**	9.29±0.02 (V)	PE	4133
	C ₃ H ₉ N	123-75-1	**	8.77±0.02 (V)	PE	4133
	(Pyrrolidine)		**	8.77±0.02 (V)	PE	4480
			**	8.77±0.05 (V)	PE	4830
			**	8.82±0.03 (V)	PE	4452
			**	8.82 (V)	PE	4742
C₄H₁₀N⁺	(C ₂ H ₅) ₃ N	121-44-8	C ₂ H ₅	13.14	EI	3674

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.	
C₄H₁₁N⁺	(C ₂ H ₅) ₂ NH	109-89-7	**	7.85±0.1	PE	4480	
			**	8.630 (V)	PE	4527	
			**	8.68 (V)	PE	4588	
	C ₂ H ₅ N(CH ₃) ₂	598-56-1	**	7.74±0.05	PE	4192	
	<i>n</i> -C ₄ H ₉ NH ₂	109-73-9	**	9.40 (V)	PE	4068	
	<i>sec</i> -C ₄ H ₉ NH ₂	13952-84-6	**	8.46±0.1	PE	4480	
	<i>iso</i> -C ₄ H ₉ NH ₂	78-81-9	**	8.50±0.1	PE	4480	
	<i>tert</i> -C ₄ H ₉ NH ₂	75-64-9	**	8.46±0.1	PE	4480	
C₅H₄N⁺	(CH ₃) ₂ NCH=CHC≡CH	2206-24-8	CH ₃ +H ₂	12.4	EI	3674	
	C ₄ H ₈ NCH=CHC≡CH	19352-85-3		15.0	EI	3674	
	(Pyrrolidine, 1-(1-buten-3-ynyl)-)						
C₅H₅N⁺	C ₅ H ₅ N (Pyridine)	110-86-1	**	9.25	PI	5028	
			**	9.4	PI	3586	
			**	9.26	PE	4867	
			**	9.263	PE	3707	
			**	9.51 (V)	PE	5258	
			**	9.59 (V)	PE	3513	
			**	9.60±0.5 (V)	PE	3685	
			**	9.66 (V)	PE	4240	
			**	9.7 (V)	PE	3832	
			**	~9.5	EI	4530	
			**	9.66±0.03	EI	3626	
			**	9.70±0.05	EI	3498	
			**	9.70	EI	5292	
			**	9.74±0.05	EI	5413	
			**	9.85±0.1	EI	4302	
			C₅H₆N⁺	(CH ₃) ₂ NCH=CHC≡CH	2206-24-8	CH ₃	11.2
C ₄ H ₈ NCH=CHC≡CH	19352-85-3	CH ₂ =CHCH ₂		11.3	EI	3674	
(Pyrrolidine, 1-(1-buten-3-ynyl)-)							
(C ₂ H ₅) ₂ NCH=CHC≡CH	1809-53-6			13.9	EI	3674	
C₅H₇N⁺	C ₄ H ₄ N(CH ₃) (1H-Pyrrole, 1-methyl-)	96-54-8	**	8.4	EI	3580	
			**	7.94±0.02	PI	5430	
	C ₅ H ₇ N (Pyridine, 1,4-dihydro-)	3337-17-5	**	7.46 (V)	PE	4586	
	C ₄ H ₄ NCH ₃ (Pyrrole, 2-methyl-)	636-41-9	**	8.01±0.05	EI	3482	
C₅H₈N⁺	(CH ₃) ₂ NCH ₂ C≡CH	7223-38-3	H	9.29	PI	5543	
C₅H₉N⁺	C ₄ H ₆ N(CH ₃) (1H-Pyrrole, 2,5-dihydro-1-methyl-)	554-15-4	**	8.21±0.05 (V)	PE	4830	
	(CH ₃) ₂ NCH ₂ C≡CH	7223-38-3	**	8.17	PI	5543	
			**	8.22±0.05	PE	4192	
	<i>n</i> -C ₄ H ₉ N≡C	2769-64-4	**	11.1 (V)	PE	4649	
	C ₅ H ₉ N (Pyridine, 1,2,3,6-tetrahydro-)	694-05-3	**	8.64±0.05 (V)	PE	4830	
	C₅H₁₀N⁺	(CH ₃) ₂ NCH ₂ CH=CH ₂	2155-94-4	H	9.56	PI	5543

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_5H_{11}N^+$	$C_4H_8N(CH_3)$ (Pyrrolidine, 1-methyl-)	120-94-5	**	8.41 ± 0.02 (V)	PE	4480
			**	8.41 ± 0.02 (V)	PE	4133
			**	8.41 ± 0.05 (V)	PE	4830
	$(CH_3)_2NCH_2CH=CH_2$	2155-94-4	**	7.84	PI	5543
			**	7.84 ± 0.05	PE	4192
			**	9.45 (V)	PE	4814
	$C_2H_5CH=NC_2H_5$ $C_2H_5N(CH_3)_3$ (Aziridine, 1,2,2-trimethyl-)	18328-91-1	**	8.68 ± 0.02 (V)	PE	4133
		23132-47-0	**			
	$C_5H_{11}N$ (Piperidine)	110-89-4	**	7.85 ± 0.1	PE	4480
			**	8.05 ± 0.05	PE	4996
			**	8.64 ± 0.02 (V)	PE	4133
			**	8.64 ± 0.05 (V)	PE	4830
			**	8.65 ± 0.10 (V)	PE	5308
			**	8.66 ± 0.03 (V)	PE	4452
			**	8.660 (V)	PE	4527
			**	8.67 (V)	PE	5540
$C_5H_{12}N^+$	$(C_2H_5)_3N$	121-44-8	CH_3	11.48	EI	3674
$C_5H_{13}N^+$	$(C_2H_5)_2(CH_3)N$	616-39-7	**	7.42 ± 0.1	PE	4480
			**	8.32 (V)	PE	4564
	<i>tert</i> - $C_3H_7NH_2$	5813-64-9	**	8.46 ± 0.1	PE	4480
	<i>neo</i> - $C_3H_7NH_2$	110-58-7	**	8.54 ± 0.1	PE	4480
$C_6H_5N^+$	C_5H_5CN (Cyclopentadienecarbonitrile)	27659-36-5	**	9.7	EI	3476
$C_6H_6N^+$	$C_6H_5COC_6H_4NH_2$ (Methanone, (2-aminophenyl)phenyl-)	2835-77-0		15.0 ± 0.3	EI	4358
				14.6 ± 0.2	EI	4358
	$C_6H_5COC_6H_4NH_2$ (Methanone, (3-aminophenyl)phenyl-)	2835-78-1		15.5 ± 0.3	EI	4358
				14.26 ± 0.2	EI	3973
	$C_6H_5COC_6H_4NH_2$ (Methanone, (4-aminophenyl)phenyl-)	1137-41-3		14.77 ± 0.2	EI	3973
			CO + OH	11.23 ± 0.1	EI	3447
	$C_6H_4(NH_2)COOH$ (Benzoic acid, 3-amino-)	99-05-8		11.53 ± 0.1	EI	3447
			CO + OH	13.10	EI	4834
	$C_6H_4(NH_2)COOH$ (Benzoic acid, 4-amino-)	150-13-0		12.50	EI	4834
			NO_2	11.60	EI	4834
	$C_6H_4(NO_2)NH_2$ (Benzenamine, 3-nitro-)	99-09-2				
			NO_2			
	$C_6H_4(NO_2)NH_2$ (Benzenamine, 4-nitro-)	100-01-6				
			Cl			
	$C_6H_4ClNH_2$ (Benzenamine, 2-chloro-)	95-51-2				
			Br			
	$C_6H_4BrNH_2$ (Benzenamine, 2-bromo-)	615-36-1				
			I			
$C_6H_7N^+$	$C_6H_5NH_2$ (Benzenamine)	62-53-3	**	7.7	PI	3586
			**	7.70 ± 0.01	PI	4028
			**	7.65 ± 0.02	PE	3890
			**	7.66	PE	3988
			**	7.71 ± 0.01	PE	4154

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₆H₇N⁺	C ₆ H ₅ NH ₂	62-53-3	**	7.71	PE	3955
			**	7.80	PE	4621
			**	8.03 (V)	PE	4884
			**	8.05 (V)	PE	4106
			**	8.05 (V)	PE	4893
			**	8.10 (V)	PE	4159
			**	7.61±0.1	EI	3788
			**	7.63	EI	3845
			**	7.89±0.03	EI	3626
			**	7.89	EI	3485
			**	8.09±<0.1	EI	3735
			**	8.27±0.05	EI	5413
			**	8.35	EI	4834
			**	8.05 (V)	PE	5272
			**	9.18 (V)	PE	5258
	CH ₃ C ₅ H ₄ N (Pyridine,2-methyl-)	109-06-8	**	9.20±0.05 (V)	PE	3685
			**	9.20 (V)	PE	5527
			**	9.37±0.05	EI	5413
			**	9.4±0.1	EI	4302
	CH ₃ C ₅ H ₄ N (Pyridine,3-methyl-)	108-99-6	**	9.29 (V)	PE	5258
			**	9.43±0.05	EI	5413
			**	9.4±0.1	EI	4302
	CH ₃ C ₅ H ₄ N (Pyridine,4-methyl-)	108-89-4	**	9.41 (V)	PE	5258
			**	9.46±0.05	EI	5413
			**	9.50±0.05 (V)	PE	3685
			**	9.5±0.1	EI	4302
			**	9.55±0.05	EI	3498
	C ₆ H ₅ (NH ₂)OCH ₃ (Benzenamine, 3-methoxy-)	536-90-3	CH ₂ O	10.51±0.1	EI	3446
			HCHO	9.58	EI	3845
			CH ₂ =C=O	10.45±0.03	EI	3483
	C ₆ H ₅ (NH ₂)OCH ₃ (Benzenamine, 4-methoxy-)	104-94-9	**	10.1	EI	4834
			**	10.60	EI	4834
			**	10.1	EI	4834
	C ₆ H ₅ NHCOCH ₃ (Acetamide, N-phenyl-)	103-84-4	**	10.60	EI	4834
			**	10.1	EI	4834
			**	10.1	EI	4834
	C ₆ H ₅ NHCONH ₂ (Urea, phenyl-)	64-10-8	**	10.1	EI	4834
			**	10.1	EI	4834
			**	10.1	EI	4834
	(C ₆ H ₅ NH ₂)(CO) ₃ Cr (Chromium, (η ⁵ -benzenamine)tricarbonyl-)	12108-11-1	**	7.96±0.1	EI	3788
			**	7.96±0.1	EI	3788
			**	7.96±0.1	EI	3788
C₆H₈N⁺	(CH ₃) ₂ NCH=CHC≡CH	2206-24-8	H	10.1	EI	3674
			H	10.1	EI	3674
C₆H₉N⁺	(CH ₃) ₂ NCH=CHC≡CH	2206-24-8	**	7.7	EI	3674
			**	7.39 (V)	PE	4255
	C ₅ H ₆ NCH ₃ (Pyridine, 1,4-dihydro-N-methyl-)	33666-44-3	**	7.39 (V)	PE	4586
			**	7.69 (V)	PE	5387
	C ₄ H ₂ NH(CH ₃) ₂ (1H-Pyrrole,2,5-dimethyl-)	625-84-3	**	7.69 (V)	PE	5387
			**	7.97±0.05	EI	3482
C₆H₁₁N⁺	C ₅ H ₁₀ N(CH ₃) (Pyridine, 1,2,3,6-tetrahydro-1-methyl-)	694-55-3	**	8.67±0.05 (V)	PE	4830
			**	8.79±0.3 (V)	PE	4818
	(CH ₂ =CHCH ₂) ₂ NH	124-02-7	**	8.79±0.3 (V)	PE	4818
			**	8.79 (V)	PE	5469

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_6H_{11}N^+$	$CH_3CH=CHCH=NC_2H_5$	3653-19-8	**	9.3 (V)	PE	4814
$C_6H_{13}N^+$	$C_5H_{10}N(CH_3)$ (Piperidine, 1-methyl-)	626-67-5	**	7.74 ± 0.05	PE	4996
			**	8.29 ± 0.02 (V)	PE	4133
			**	8.29 ± 0.02 (V)	PE	4480
			**	8.29 ± 0.05 (V)	PE	4830
	$n-C_3H_7N=CHCH_2CH_3$	7707-70-2	**	8.55 ± 0.2	EI	4360
	$n-C_3H_7N=C(CH_3)_2$	22023-64-9	**	8.31 ± 0.2	EI	4360
	$(iso-C_3H_7)CH=NC_2H_5$	1743-56-2	**	9.25 (V)	PE	4814
	$iso-C_3H_7N=C(CH_3)_2$	3332-08-9	**	8.36 ± 0.2	EI	4360
	$iso-C_3H_7N=CHCH_2CH_3$	28916-23-6	**	8.50 ± 0.2	EI	4360
	$C_6H_{13}N$ (1 <i>H</i> -Azepine, hexahydro-)	111-49-9	**	8.41 ± 0.02 (V)	PE	4133
	$C_6H_{11}NH_2$ (Cyclohexanamine)	108-91-8	**	8.37 ± 0.1	PE	4480
	$C_5H_{10}NCH_3$ (Piperidine, 2-methyl-)	109-05-7	**	7.76 ± 0.05	PE	4996
	$C_5H_{10}NCH_3$ (Piperidine, 3-methyl-)	626-56-2	**	7.94 ± 0.05	PE	4996
	$C_5H_{10}NCH_3$ (Piperidine, 4-methyl-)	626-58-4	**	8.01 ± 0.05	PE	4996
$C_6H_{15}N^+$	$(C_2H_5)_3N$	121-44-8	**	7.11 ± 0.1	PE	4480
			**	7.20 ± 0.09	PE	4497
			**	8.08 (V)	PE	4564
			**	8.19 ± 0.05 (V)	PE	3987
	$n-C_6H_{13}NH_2$	111-26-2	**	8.63 ± 0.05	PI	5508
	$(n-C_5H_7)_2NH$	142-84-7	**	7.76 ± 0.1	PE	4480
			**	8.59 ± 0.3 (V)	PE	4818
	$(iso-C_3H_7)_2NH$	108-18-9	**	7.59 ± 0.1	PE	4480
$C_7H_9N^+$	$C_6H_5(CN)COOH$ (Benzoic acid, 4-cyano-)	619-65-8	CO + OH	15.68 ± 0.2	EI	3973
	$C_6H_5(NO_2)CN$ (Benzonitrile, 3-nitro-)	619-24-9	NO ₂	12.25 ± 0.1	EI	3447
	$C_6H_5(NO_2)CN$ (Benzonitrile, 4-nitro-)	619-72-7	NO ₂	12.42 ± 0.1	EI	3447
$C_7H_5N^+$	$C_6H_5N \equiv C$ (Benzene, isocyano-)	931-54-4	**	9.50 (V)	PE	4649
	C_6H_5CN (Benzonitrile)	100-47-0	**	9.62	PE	3938
			**	9.69	PE	4621
			**	9.70 (V)	PE	4334
			**	9.70 (V)	PE	4969
			**	9.71 (V)	PE	5259
			**	9.72 (V)	PE	5272
			**	9.7	EI	3916
			**	9.77	EI	3845
			**	10.13 ± 0.03	EI	5080
	$C_6H_5(CN)OCH_3$ (Benzonitrile, 3-methoxy-)	1527-89-5	CH ₂ O	12.23 ± 0.1	EI	3446
	$C_6H_5(CN)OCH_3$ (Benzonitrile, 4-methoxy-)	874-90-8	CH ₂ O	12.30 ± 0.1	EI	3446
			HCHO	12.39	EI	3845

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₇H₈N⁺	C ₆ H ₇ (NH ₂)CH ₃ (Benzenamine, 2-methyl-)	95-53-4	H	11.25 ± 0.05	PI	4028
	C ₆ H ₄ (NH ₂)CH ₃ (Benzenamine, 4-methyl-)	106-49-0	H	11.00 ± 0.1	PI	4028
	C ₆ H ₄ (NH ₂)C ₄ H ₉ (Benzenamine, 3-butyl-)	5369-17-5		12.13 ± 0.1	EI	3629
	C ₆ H ₄ (NH ₂)C ₄ H ₉ (Benzenamine, 4-butyl-)	104-13-2		11.10 ± 0.1	EI	3629
	C ₆ H ₅ CH ₂ C ₆ H ₄ NH ₂ (Benzenamine, 4-(phenylmethyl)-)	1135-12-2	C ₆ H ₅	10.6 ± 0.1	EI	3807
	(C ₆ H ₄ NH ₂) ₂ CH ₂ (Benzenamine, 4,4'-methylenebis-)	101-77-9		10.6 ± 0.1	EI	3807
	C ₆ H ₄ (CH ₃)NHCOCH ₃ (Acetamide, <i>N</i> -(2-methylphenyl)-)	120-66-1	CH ₃ CO	13.97 ± 0.02	EI	3631
	C ₆ H ₄ (CH ₃)NHCOCH ₃ (Acetamide, <i>N</i> -(4-methylphenyl)-)	103-89-9	CH ₃ CO	14.21 ± 0.02	EI	3631
	C ₆ H ₄ (NH ₂)CH ₂ CH ₂ OCOCH ₃ (Benzenethanol, 4-amino-, acetate(ester))	33709-38-5		11.00	EI	3590
	C ₆ H ₄ (NO ₂)CH ₂ C ₆ H ₄ NH ₂ (Benzenamine, 4-[(4-nitrophenyl)methyl]-)	726-17-0		11.6 ± 0.2	EI	3807
	C ₅ H ₅ N(CH=CH ₂)BF ₄ (Pyridinium, 1-ethenyl-tetrafluoroborate (1-))	XXXXXX-XX-X		9.0 ± 0.1	EI	5502
C₇H₉N⁺	C ₆ H ₇ (NH ₂)CH ₃ (Benzenamine, 2-methyl-)	95-53-4	**	7.44 ± 0.02	PI	4028
			**	7.45 ± 0.02	PE	3890
			**	7.52	PE	3988
			**	7.83 (V)	PE	4106
			**	7.83 (V)	PE	5272
			**	7.84 (V)	PE	4893
	C ₆ H ₄ (NH ₂)CH ₃ (Benzenamine, 3-methyl-)	108-44-1	**	7.55	PE	3988
			**	7.66 (V)	PE	5272
			**	7.66 (V)	PE	4106
			**	7.82 (V)	PE	4893
	C ₆ H ₄ (NH ₂)CH ₃ (Benzenamine, 4-methyl-)	106-49-0	**	7.24 ± 0.02	PI	4028
			**	7.37	PE	3988
			**	7.44 ± 0.02	PI	4028
			**	7.62 (V)	PE	4106
			**	7.81 (V)	PE	4893
			**	7.85 ± 0.05 (V)	PE	5013
	C ₆ H ₅ NHCH ₃ (Benzenamine, <i>N</i> -methyl-)	100-61-8	**	7.32	PE	3988
			**	7.35 ± 0.02	PE	3890
	C ₆ H ₅ CH ₂ NH ₂ (Benzenemethanamine)	100-46-9	**	9.10 ± 0.01 (V)	PE	4154
	C ₅ H ₃ N(CH ₃) ₂ (Pyridine, 2,5-dimethyl-)	589-93-5	**	8.80 ± 0.05 (V)	PE	3685
	C ₅ H ₃ N(CH ₃) ₂ (Pyridine, 2,6-dimethyl-)	108-48-5	**	8.87	PE	4867
			**	9.23 ± 0.05	EI	3498
			**	8.90 ± 0.05 (V)	PE	3685
			**	9.23	EI	5292
	(CH ₃) ₂ C ₅ H ₃ N (Pyridine, 3,4-dimethyl-)	583-58-4	**	9.15 (V)	PE	5527
	(CH ₃) ₂ C ₅ H ₃ N (Pyridine, 3,5-dimethyl-)	591-22-0	**	9.25 (V)	PE	5527
	C ₆ H ₄ (NH ₂)C ₄ H ₉ (Benzenamine, 3-butyl-)	5369-17-5	CH ₂ =CHCH ₃	10.10 ± 0.1	EI	3629

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₇H₉N⁺	C ₇ H ₉ (NH) ₂ C ₄ H ₉ (Benzenamine, 4-butyl-)	104-13-2	CH ₂ =CHCH ₃	9.37±0.1	EI	3629
	C ₇ H ₉ (CH ₃)NHC(=O)CH ₃ (Acetamide, <i>N</i> -(2-methylphenyl)-)	120-66-1	CH ₂ =C=O	10.05±0.02	EI	3631
	C ₇ H ₉ (CH ₃)NHC(=O)CH ₃ (Acetamide, <i>N</i> -(4-methylphenyl)-)	103-89-9	CH ₂ =C=O	10.12±0.02	EI	3631
C₇H₁₀N⁺	(C ₂ H ₅) ₂ NCH=CHC≡CH	1809-53-6	CH ₃	13.1	EI	3674
C₇H₁₁N⁺	C ₇ H ₁₁ N (1-Azabicyclo[2.2.2]oct-2-ene)	13929-94-7	**	8.02	PE	5185
	C ₇ H ₁₁ N (2-Azabicyclo[2.2.2]oct-5-ene)	3693-58-1	**	8.35±0.05 (V)	PE	4830
	C ₇ H ₁₀ NH (2-Azabicyclo[3.2.1]oct-6-ene)	71017-41-9	**	8.60 (V)	PE	5481
	C ₆ H ₁₁ N≡C (Cyclohexane, isocyano-)	931-53-3	**	11.0 (V)	PE	4649
	C ₇ H ₂ N(CH ₃) ₃ (Pyrrole, 1,3,4-trimethyl-)	30144-12-8	**	7.3	EI	3580
C₇H₁₃N⁺	C ₅ H ₇ (N(CH ₃) ₂) (2-Cyclopenten-1-amine, <i>N,N</i> -dimethyl-)	13044-51-4	**	9.32±0.05 (V)	PE	4954
	(CH ₂ =CHCH ₂) ₂ (CH ₃)N	2424-01-3	**	8.41±0.3 (V)	PE	4818
	C ₇ H ₁₃ N (1-Azabicyclo[2.2.2]octane)	100-76-5	**	7.50±0.09	PE	4497
	C ₇ H ₁₃ N (2-Azabicyclo[2.2.2]octane)	280-38-6	**	8.06±0.015 (V)	PE	4286
	C ₇ H ₁₃ N (4-Azabicyclo[2.2.2]octane)	100-76-5	**	8.22±0.05 (V)	PE	4830
	C ₇ H ₁₃ N (4-Azabicyclo[2.2.2]octane)	100-76-5	**	7.50±0.1	PE	4480
	C ₅ H ₇ N(CH ₃) ₂ (1-Cyclopenten-1-amine, <i>N,N</i> -dimethyl-)	4840-12-4	**	7.46 (V)	PE	5185
C₇H₁₅N⁺	C ₆ H ₁₂ NCH ₃ (1 <i>H</i> -Azepine, hexahydro-1-methyl-)	1192-95-6	**	8.29±0.02 (V)	PE	4133
	C ₅ H ₉ N(CH ₃) ₂ (Cyclopentanamine, <i>N,N</i> -dimethyl-)	18636-91-4	**	8.34 (V)	PE	5185
C₈H₆N⁺	C ₆ H ₃ (CN)C ₃ H ₉ (Benzonitrile, 3-butyl-)	20651-74-5		12.90±0.1	EI	3629
	C ₆ H ₃ (CN)C ₄ H ₉ (Benzonitrile, 4-butyl-)	20651-73-4		12.71±0.1	EI	3629
C₈H₇N⁺	C ₆ H ₅ CH ₂ CN (Benzeneacetonitrile)	140-29-4	**	9.34	EI	4934
	C ₆ H ₅ CH ₂ N≡C (Benzene, (isocyanomethyl)-)	10340-91-7	**	9.47 (V)	PE	4649
	C ₆ H ₃ (CH ₃)CN (Benzonitrile, 2-methyl-)	529-19-1	**	9.38 (V)	PE	5272
	C ₆ H ₃ (CH ₃)CN (Benzonitrile, 2-methyl-)		**	9.40 (V)	PE	5259
	C ₆ H ₃ (CH ₃)CN (Benzonitrile, 3-methyl-)	620-22-4	**	9.34 (V)	PE	5259
	C ₆ H ₃ (CH ₃)CN (Benzonitrile, 3-methyl-)		**	9.40 (V)	PE	5272
	C ₆ H ₃ (CH ₃)CN (Benzonitrile, 4-methyl-)	104-85-8	**	9.38 (V)	PE	5259

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_8H_7N^+$	$C_8H_7(CH_3)CN$	104-85-8	**	9.33 (V)	PE	5272
			**	9.31	EI	4089
			**	9.32	EI	4934
	C_7H_5CN (2,4,6-Cycloheptatriene-1-carbonitrile)	13612-59-4	**	8.89	EI	4934
	$C_6H_4C_2H_2NH$ (1H-Indole)	120-72-9	**	7.75 ± 0.015 (V)	PE	5522
			**	7.87 (V)	PE	4586
			**	7.91 (V)	PE	5396
			**	7.92 ± 0.05 (V)	PE	4672
			**	8.29 ± 0.05	EI	4316
	C_8H_7N (Indolizine)	274-40-8	**	7.24 (V)	PE	4812
	$C_6H_4(CN)C_4H_9$ (Benzonitrile, 3-butyl-)	20651-74-5	$CH_2=CHCH_3$	11.55 ± 0.1	EI	3629
	$C_6H_4(CN)C_4H_9$ (Benzonitrile, 4-butyl-)	20651-73-4	$CH_2=CHCH_3$	11.66 ± 0.1	EI	3629
$C_8H_9N^+$	C_8H_9N (9-Azabicyclo[4.2.1]nona-2,4,7-triene)	6789-38-4	**	8.45 (V)	PE	4136
	C_8H_9N (1H-Indole, 2,3-dihydro-)	496-15-1	**	7.15 ± 0.02	PE	3890
	$C_6H_5CH=NCH_3$ (Methanamine, N-(phenylmethylene)-)	622-29-7	**	8.77	PE	4421
	$C_6H_4(NH_2)CH_2CH_2OCOCH_3$ (Benzeneethanol, 4-amino-, acetate(ester))	33709-38-5		7.80	EI	3590
$C_8H_{10}N^+$	$C_6H_5N(CH_3)_2$ (Benzenamine, <i>N,N</i> -dimethyl-)	121-69-7	H	10.56 ± 0.05	PI	4028
	$C_4H_8NCH=CHC \equiv CH$ (Pyrrolidine, 1-(1-buten-3-ynyl)-)	19352-85-3	H	10.7	EI	3674
	$C_6H_5CH_2N(CH_3)_2$ (Benzenemethanamine, dimethyl-)	28262-13-7	H	9.57	PI	5543
$C_8H_{11}N^+$	$C_8H_{11}N$ (9-Azabicyclo[4.2.1]nona-2,4-diene)	7129-31-9	**	8.36 (V)	PE	4136
	$C_7H_9NCH_3$ (2-Azabicyclo[3.2.1]octa-3,6-diene, 2-methyl-)	56125-88-3	**	7.28 (V)	PE	5481
	$C_6H_5(NH_2)(CH_3)_2$ (Benzenamine, 2,3-dimethyl)	87-59-2	**	7.77 ± 0.05 (V)	PE	5013
	$C_6H_5(NH_2)(CH_3)_2$ (Benzenamine, 2,4-dimethyl)	95-68-1	**	7.65 ± 0.05 (V)	PE	5013
	$C_6H_5(NH_2)(CH_3)_2$ (Benzenamine, 2,5-dimethyl)	95-78-3	**	7.78 ± 0.05 (V)	PE	5013
	$C_6H_5(CH_3)_2NH_2$ (Benzenamine, 2,6-dimethyl-)	87-62-7	**	7.30 ± 0.02	PE	3890
			**	7.36	PE	3988
			**	7.78 ± 0.05 (V)	PE	5013
			**	7.68 ± 0.05 (V)	PE	5013
	$C_6H_5(NH_2)(CH_3)_2$ (Benzenamine, 3,4-dimethyl)	95-64-7	**			
	$C_6H_5(NH_2)(CH_3)_2$ (Benzenamine, 3,5-dimethyl)	108-69-0	**	7.75 ± 0.05 (V)	PE	5013
	$C_6H_4(CH_3)NHCH_3$ (Benzenamine, <i>N</i> ,2-dimethyl-)	611-21-2	**	7.27	PE	3988
	$C_6H_4(CH_3)NHCH_3$ (Benzenamine, <i>N</i> ,3-dimethyl-)	696-44-6	**	7.26	PE	3988
	$C_6H_4(CH_3)NHCH_3$ (Benzenamine, <i>N</i> ,4-dimethyl-)	623-08-5	**	7.13	PE	3988

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₈H₁₁N⁺	C ₆ H ₅ N(CH ₃) ₂ (Benzenamine, <i>N,N</i> -dimethyl-)	121-69-7	**	7.13±0.04	PI	4028
			**	7.10±0.02	PE	3890
			**	7.11	PE	3988
			**	7.15	PE	4621
			**	7.35 (V)	PE	4884
			**	7.37 (V)	PE	4106
			**	7.2	CTS	3543
			**	7.42	CTS	4029
			**	7.6 (V)	PE	5378
			**	7.78	EI	4863
			**	7.92 (V)	PE	5272
	C ₆ H ₅ CH ₂ CH ₂ NH ₂ (Benzeneethanamine)	64-04-0	**	8.99±0.20 (V)	PE	4672
	C ₆ H ₅ CH ₂ NHCH ₃ (Benzenemethanamine, <i>N</i> -methyl-)	103-67-3	**	8.73 (V)	PE	5134
	C ₅ H ₄ =CHN(CH ₃) ₂ (Methanamine, 1-(2,4-cyclopentadien-1-ylidene)- <i>N,N</i> -dimethyl-)	696-68-4	**	7.43 (V)	PE	4357
C₈H₁₂N⁺	(CH ₃) ₃ C ₅ H ₂ N (Pyridine, 2,4,6-trimethyl-)	108-75-8	**	8.9±0.1 (V)	PE	5527
	C ₄ H ₅ NCH=CHC≡CH (Pyrrolidine, 1-(1-buten-3-ynyl)-)	19352-85-3	**	7.5	EI	3674
	(C ₂ H ₅) ₂ NCH=CHC≡CH	1809-53-6	H	9.9	EI	3674
	C ₇ H ₁₀ N(CH ₃) (2-Azabicyclo[2.2.2]oct-5-ene, 2-methyl-)	3693-61-6	**	7.97±0.05 (V)	PE	4830
	(C ₂ H ₅) ₂ NCH=CHC≡CH	1809-53-6	**	8.0	EI	3674
	C ₈ H ₁₃ N (9-Azabicyclo[4.2.1]non-7-ene)	51787-59-8	**	8.76 (V)	PE	4136
	C ₇ H ₁₀ NCH ₃ (2-Azabicyclo[3.2.1]oct-3-ene, 2-methyl-)	56125-90-7	**	7.36 (V)	PE	5481
	C ₇ H ₁₀ NCH ₃ (2-Azabicyclo[3.2.1]oct-6-ene, 2-methyl-)	56125-92-9	**	8.18 (V)	PE	5481
	C ₄ H ₄ NC ₂ H ₅ (1 <i>H</i> -Pyrrole, 2-(1,1-dimethylethyl)-)	5398-58-3	**	7.95±0.05	EI	3482
	C ₁₁ H ₂₂ N ₂ (8-Azabicyclo[3.2.1]octan-3-amine, 8-methyl- <i>N</i> -propyl- <i>endo</i> -)	67216-34-6		10.1±0.3	EI	5401
	C ₁₁ H ₂₂ N ₂ (8-Azabicyclo[3.2.1]octan-3-amine, 8-methyl- <i>N</i> -propyl- <i>exo</i> -)	67139-56-4	C ₃ H ₇ NH	10.5±0.3	EI	5401
	C ₈ H ₁₅ NO (8-Azabicyclo[3.2.1]octan-3-ol, 8-methyl- <i>endo</i> -)	120-29-6	OH	10.2±0.3	EI	5401
	C ₈ H ₁₅ NO (8-Azabicyclo[3.2.1]octan-3-ol, 8-methyl- <i>exo</i> -)	135-97-7	OH	10.7±0.3	EI	5401
	C ₈ H ₁₇ NO (8-Azabicyclo[3.2.1]octane, 3-methoxy-8-methyl- <i>endo</i> -)	XXXXX-XX-X	CH ₃ O	9.8±0.3	EI	5401
	C ₈ H ₁₇ NO (8-Azabicyclo[3.2.1]octane, 3-methoxy-8-methyl- <i>exo</i> -)	16487-33-5	CH ₃ O	10.2±0.3	EI	5401
C₈H₁₄N⁺	C ₁₁ H ₁₉ NO (8-Azabicyclo[3.2.1]octane, 3-phenoxy- <i>endo</i> -)	XXXXX-XX-X	C ₆ H ₅ O	9.1±0.3	EI	5401
	C ₁₁ H ₁₉ NO (8-Azabicyclo[3.2.1]octane, 3-phenoxy- <i>exo</i> -)	16487-31-3	C ₆ H ₅ O	8.8±0.3	EI	5401
	C ₁₀ H ₁₇ NO ₂ (8-Azabicyclo[3.2.1]octan-3-ol, 8-methyl acetate(ester), <i>endo</i> -)	3423-27-6	C ₂ H ₅ O ₂	10.2±0.3	EI	5401
	C ₁₀ H ₁₇ NO ₂ (8-Azabicyclo[3.2.1]octan-3-ol, 8-methyl acetate(ester), <i>exo</i> -)	3423-26-5		10.3±0.3	EI	5401
	C ₁₀ H ₁₈ N ₂ O ₂ (8-Azabicyclo[3.2.1]octan-3-ol, 8-methyl methylcarbamate(ester), <i>endo</i> -)	67139-52-0	C ₂ H ₅ NO ₂	9.8±0.3	EI	5401

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_8H_{11}N^+$	$C_{10}H_{18}N_2O_2$ (8-Azabicyclo[3.2.1]octan-3-ol,8-methyl-methylcarbamate(ester), <i>exo</i> -)	67139-53-1	$C_2H_4NO_2$	10.2 ± 0.3	EI	5401
	$C_{17}H_{20}N_2O_2$ (8-Azabicyclo[3.2.1]octan-3-ol,8-methyl-phenylcarbamate(ester)- <i>exo</i> -)	29364-21-4	$C_7H_6NO_2$	9.2 ± 0.3	EI	5401
	$C_{17}H_{20}N_2OS$ (Carbamothioic acid,phenyl-0-(8-methyl-8-azabicyclo[3.2.1]oct-3-yl)ester, <i>endo</i> -)	67139-54-2	C_7H_6NOS	8.4 ± 0.3	EI	5401
	$C_{17}H_{20}N_2OS$ (Carbamothioic acid,phenyl-0-(8-methyl-8-azabicyclo[3.2.1]oct-3-yl)ester, <i>exo</i> -)	67139-55-3	C_7H_6NOS	8.6 ± 0.3	EI	5401
	$C_9H_{17}NO_3S$ (8-Azabicyclo[3.2.1]octan-3-ol,8-methyl-methanesulfonate(ester), <i>endo</i> -)	35130-97-3	CH_3O_3S	9.1 ± 0.3	EI	5401
	$C_9H_{17}NO_3S$ (8-Azabicyclo[3.2.1]octan-3-ol,8-methyl-methanesulfonate(ester), <i>exo</i> -)	35136-87-9	CH_3O_3S	9.6 ± 0.3	EI	5401
	$C_8H_{14}NCl$ (8-Azabicyclo[3.2.1]octane,3-chloro-8-methyl- <i>endo</i> -)	13514-03-9	Cl	9.1 ± 0.3	EI	5401
	$C_8H_{14}NCl$ (8-Azabicyclo[3.2.1]octane,3-chloro-8-methyl- <i>exo</i> -)	2292-12-8	Cl	9.5 ± 0.3	EI	5401
	$C_8H_{14}NBr$ (8-Azabicyclo[3.2.1]octane,3-bromo-8-methyl- <i>endo</i> -)	27809-79-6	Br	9.1 ± 0.3	EI	5401
	$C_8H_{14}NBr$ (8-Azabicyclo[3.2.1]octane,3-bromo-8-methyl- <i>exo</i> -)	2292-11-7	Br	8.9 ± 0.3	EI	5401
$C_8H_{15}N^+$	$C_7H_{12}N(CH_3)$ (2-Azabicyclo[2.2.2]octane,2-methyl-)	55100-40-8	**	7.78 ± 0.05 (V)	PE	4830
	<i>tert</i> - $C_4H_9CH=NCH_2CH=CH_2$	68003-54-3	**	9.31 (V)	PE	4968
	<i>tert</i> - $C_4H_9CH=NCH=CHCH_3$	68003-65-6	**	8.69 (V)	PE	4968
	$C_8H_{15}N$ (9-Azabicyclo[4.2.1]nonane)	284-18-4	**	8.50 (V)	PE	4136
	$C_7H_{12}NCH_3$ (1-Azabicyclo[2.2.2]octane, 4-methyl-)	45651-41-0	**	8.06 ± 0.015 (V)	PE	4286
	$C_6H_9N(CH_3)_2$ (1-Cyclohexen-1-amine,N,N-dimethyl-)	13815-46-8	**	7.56 (V)	PE	5185
	$((CH_3)_3N)CH=C(CH_3)_2$ (Pyrrolidine, 1-(2-methyl-1-propenyl)-)	2403-57-8	**	7.66 ± 0.03 (V)	PE	4452
$C_8H_{17}N^+$	$C_6H_{11}N(CH_3)_2$ (Cyclohexanamine,N,N-diethyl-)	XXXXXX-XX-X	**	8.09 (V)	PE	5185
	$((CH_3)_3N)CH_2CH(CH_3)_2$ (Pyrrolidine, 1-(2-methylpropyl)-)	39198-81-7	**	8.17 ± 0.03 (V)	PE	4452
$C_9H_7N^+$	C_9H_7N (Isoquinoline)	119-65-3	**	8.50	PE	3638
			**	8.50	PE	4515
			**	8.54 (V)	PE	3723
	C_9H_7N (Quinoline)	91-22-5	**	8.3	PI	3586
			**	8.62	PE	3638
			**	8.62	PE	4066
			**	8.62 (V)	PE	3723
$C_9H_9N^+$	$C_6H_5CH(N \equiv C)CH_3$ (Benzene, (1-isocyanoethyl)-(R)-)	21872-33-3	**	9.37 (V)	PE	4649
	$C_8H_7C_2H_2NCH_3$ (1H-Indole,1-methyl-)	603-76-9	**	7.74 ± 0.03	PI	5552
			**	7.48 ± 0.015	PE	5522
			**	7.71 (V)	PE	4586
	$CH_3C_6H_3C_2H_2NH$ (1H-Indole,2-methyl-)	95-20-5	**	7.44 ± 0.015	PE	5522

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₉H₉N⁺	CH ₃ C ₆ H ₃ C ₂ H ₂ NH (1H-Indole,3-methyl-)	83-34-1	**	7.54±0.015	PE	5522
	CH ₃ C ₆ H ₃ C ₂ H ₂ NH (1H-Indole,4-methyl-)	16096-32-5	**	7.60±0.015	PE	5522
	C ₆ H ₁ C ₂ H(CH ₃)NH (1H-Indole,6-methyl-)	3420-02-8	**	7.54±0.015	PE	5522
	C ₆ H ₃ C ₂ H(CH ₃)NH (1H-Indole,7-methyl-)	933-67-5	**	7.53±0.015	PE	5522
	C ₈ H ₆ NCH ₃ (2H-Isoindole, 2-methyl-)	33804-84-1	**	7.12 (V)	PE	4935
			**	7.22 (V)	PE	4586
C₉H₁₁N⁺	C ₉ H ₁₁ N (Isoquinoline, 1,2,3,4-tetrahydro-)	91-21-4	**	8.57±0.05 (V)	PE	4830
	C ₉ H ₁₁ N (Quinoline, 1,2,3,4-tetrahydro-)	635-46-1	**	7.00±0.02	PE	3890
C₉H₁₃N⁺	C ₆ H ₁ CH ₃ (N(CH ₃) ₂) (Benzeneamine,N,N,3-trimethyl-)	121-72-2	**	7.24 (V)	PE	5272
	C ₆ H ₁ CH ₃ (N(CH ₃) ₂) (Benzeneamine,N,N,2-trimethyl-)	609-72-3	**	7.92 (V)	PE	5272
	C ₇ H ₁₂ NC≡CH (1-Azabicyclo[2.2.2]octane, 4-ethynyl-)	52547-86-1	**	8.30±0.015 (V)	PE	4286
	C ₆ H ₁ CH ₃ N(CH ₃) ₂ (Benzenamine, N,N,4-trimethyl-)	99-97-8	**	6.95	PE	3988
			**	6.9±0.1	PE	4401
			**	7.27 (V)	PE	5272
			**	7.15	PE	3988
	C ₆ H ₃ (CH ₃) ₂ NH ₂ (Benzenamine, 2,4,6-trimethyl-)	88-05-1	**	7.15	PE	3988
	C ₆ H ₃ (CH ₃) ₂ NHCH ₃ (Benzenamine, N,2,6-trimethyl-)	767-71-5	**	7.34	PE	3988
	C ₆ H ₄ (CH ₃)N(CH ₃) ₂ (Benzenamine, N,N,2-trimethyl-)	609-72-3	**	7.40±0.02	PE	3890
			**	7.44	PE	3988
			**	7.92 (V)	PE	4106
			**	7.06	PE	3988
	C ₆ H ₄ (CH ₃)N(CH ₃) ₂ (Benzenamine, N,N,3-trimethyl-)	121-72-2	**	7.24 (V)	PE	4106
			**	7.27 (V)	PE	4106
			**	8.66±0.20 (V)	PE	4672
			**	8.99±0.06 (V)	PE	4758
	C ₆ H ₃ CH ₂ CH ₂ NHCH ₃ (Benzeneethanamine, N-methyl-)	589-08-2	**	8.91±0.14 (V)	PE	4672
			**	7.69	PI	5543
			**	7.69±0.05	PE	4192
			**	8.89±0.12 (V)	PE	4672
	C ₆ H ₃ CH ₂ N(CH ₃) ₂ (Benzenemethanamine,dimethyl-)	103-83-3	**	9.30±0.05 (V)	PE	3685
			**	7.69	PE	4192
	C ₆ H ₃ (CH ₃) ₃ NH ₂ (Benzenepropanamine)	2038-57-5	**	8.89±0.12 (V)	PE	4672
			**	9.30±0.05 (V)	PE	3685
	C ₇ H ₄ NC(CH ₃) ₃ (Pyridine, 4-(1,1-dimethylethyl)-)	3978-81-2	**	9.30±0.05 (V)	PE	3685
C₉H₁₅N⁺	(CH ₂ =CHCH ₂) ₃ N	102-70-5	**	8.30±0.3 (V)	PE	4818
			**	8.30 (V)	PE	5469
	C ₉ H ₁₅ N (1-Azatricyclo[3.3.1.1 ^{1,4}]decane)	281-27-6	**	7.57±0.02	PE	4217
			**	7.10±0.05 (V)	PE	4654
	C ₉ H ₁₁ NC ₂ H ₇ (Pyrrolidine, 1-(1-cyclopenten-1-yl)-)	7148-07-4	**	7.10±0.05 (V)	PE	4654

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₉H₁₇N⁺	(CH ₃) ₂ C=NC ₆ H ₁₁	XXXXX-XX-X	**	8.23	PE	5589
	C ₈ H ₁₃ NCH ₃	491-25-8	**	7.84 (V)	PE	5091
	(9-Azabicyclo[3.3.1]nonane, 9-methyl-)					
	C ₇ H ₁₂ NC ₂ H ₅	45732-65-8	**	8.05±0.015 (V)	PE	4286
	(1-Azabicyclo[2.2.2]octane, 4-ethyl-)					
C₉H₁₉N⁺	C ₆ H ₁₁ N=C(CH ₃) ₂	6407-36-9	**	8.23	PE	4043
	(Cyclohexanamine, N-(1-methylethylidene)-)					
	((CH ₂) ₅ N)CH=C(CH ₃) ₂	673-33-6	**	7.93±0.03 (V)	PE	4452
C₉H₂₁N⁺	(Piperidine, 1-(2-methyl-1-propenyl)-)					
	((CH ₂) ₅ N)CH ₂ CH(CH ₃) ₂	10315-89-6	**	8.16±0.03 (V)	PE	4452
	(Piperidine, 1-(2-methylpropyl)-)					
C₉H₂₁N⁺	C ₅ H ₇ N(CH ₃) ₄	768-66-1	**	7.39	PE	4278
	(Piperidine, 2,2,6,6-tetramethyl-)					
C₉H₂₁N⁺	(n-C ₃ H ₇) ₃ N	102-69-2	**	7.03±0.09	PE	4497
			**	7.03±0.1	PE	4480
			**	8.04±0.3 (V)	PE	4818
	<i>tert</i> -C ₅ H ₁₁ (<i>tert</i> -C ₄ H ₉)NH	58471-09-3	**	7.81±0.1	PE	4480
C₁₀H₇N⁺	C ₁₀ H ₇ N	209-81-4	**	7.63 (V)	PE	4812
	(Pyrrolo[2,1,5- <i>cd</i>]indolizine)					
C₁₀H₉N⁺	C ₁₀ H ₇ (NH ₂)	134-32-7	**	7.3	PI	3586
	(1-Naphthalenamine)					
			**	7.46 (V)	PE	4466
	C ₉ H ₉ NCH ₃	1125-80-0	**	8.11	PE	4515
	(Isoquinoline, 3-methyl-)					
			**	7.74±0.02	PE	4143
	C ₁₀ H ₇ NH ₂	91-59-8	**	7.10±0.02	PE	4143
	(2-Naphthalenamine)					
C₁₀H₉N⁺			**	7.2	PI	3586
			**	7.56 (V)	PE	4466
	C ₁₀ H ₉ N	5176-20-5	**	8.25±0.05 (V)	PE	4830
	(Naphthalen-1,4-imine, 1,4-dihydro-)					
C₁₀H₁₁N⁺	C ₆ H ₅ CH=NCH=CHCH ₃ (z)	53146-18-2	**	8.33 (V)	PE	4968
	C ₁₀ H ₁₁ N	5176-30-7	**	8.44±0.05 (V)	PE	4830
	(Naphthalen-1,4-imine, 1,2,3,4-tetrahydro-)					
C₁₀H₁₃N⁺	C ₆ H ₅ CH=NCH ₂ CH=CH ₂	68003-55-4	**	8.87 (V)	PE	4968
	(2-Propen-1-amine, N-(phenylmethylene)-(E)-)					
C₁₀H₁₃N⁺	C ₉ H ₁₀ N(CH ₃)	1612-65-3	**	8.60±0.05 (V)	PE	4830
	(Isoquinoline, 1,2,3,4-tetrahydro-2-methyl-)					
C₁₀H₁₄N⁺	CH ₃ C ₆ H ₄ CH ₂ N(CH ₃) ₂	56927-89-0	H	9.5	PI	5543
	(Benzenemethanamine, N,N, <i>ar</i> -trimethyl-)					
C₁₀H₁₅N⁺	C ₉ H ₁₃ N=CH ₂	42949-22-4	**	7.78±0.02 (V)	PE	4217
	(1-Azatricyclo[3.3.1.1 ^{3,7}]decane, 4-methylene-)					
C₁₀H₁₅N⁺	C ₆ H ₄ (NH ₂)C ₃ H ₉	5369-17-5	**	7.51±0.1	EI	3629
	(Benzenamine, 3-butyl-)					

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{10}H_{15}N^+$	$C_6H_4(NH_2)C_4H_9$ (Benzenamine, 4-butyl-)	104-13-2	**	7.61 ± 0.1	EI	3629
	$C_6H_5N(C_2H_5)_2$ (Benzenamine, <i>N,N</i> -diethyl-)	91-66-7	**	6.95 ± 0.02	PE	3890
	$C_6H_2(CH_3)_3NHCH_3$ (Benzenamine, <i>N</i> ,2,4,6-tetramethyl-)	13021-14-2	**	7.22	PE	3988
	$C_6H_4(CH_3)_2N(CH_3)_2$ (Benzenamine, <i>N,N</i> ,2,6-tetramethyl-)	769-06-2	**	7.30 ± 0.02	PE	3890
			**	7.42	PE	3988
	$C_6H_5CH_2CH_2N(CH_3)_2$ (Benzeneethanamine, <i>N,N</i> -dimethyl-)	1126-71-2	**	7.70 ± 0.05	PE	4192
			**	8.35 ± 0.14 (V)	PE	4672
	$C_6H_5CH_2CH_2N(CH_3)_2$ (Benzeneethanamine, dimethyl-)	29088-49-1	**	7.70	PI	5543
	$CH_3C_6H_4CH_2N(CH_3)_2$ (Benzenemethanamine, <i>N,N</i> , <i>ar</i> -trimethyl-)	56927-89-0	**	7.61	PI	5543
	$C_6H_5CH_2CH(CH_3)NHCH_3$ (Benzenethanamine, <i>N</i> , α -dimethyl-)	7632-10-2	**	8.60 ± 0.20 (V)	PE	4672
$C_{10}H_{17}N^+$	$((CH_2)_4N)(C_6H_9)$ (Pyrrolidine, 1-(1-cyclohexen-1-yl)-)	1125-99-1	**	7.10 ± 0.03 (V)	PE	4452
			**	7.14 ± 0.05	PE	4654
	$C_5H_{10}NC_5H_7$ (Piperidine, 1-(1-cyclopenten-1-yl)-)	1614-92-2	**	7.4 ± 0.05 (V)	PE	4654
$C_{10}H_{19}N^+$	$((CH_2)_4N)(C_6H_{11})$ (Pyrrolidine, 1-cyclohexyl-)	7731-02-4	**	7.96 ± 0.03 (V)	PE	4452
	$C_7H_{12}N(iso-C_3H_7)$ (1-Azabicyclo[2.2.2]octane, 4-(1-methylethyl)-)	45842-68-0	**	7.99 ± 0.015 (V)	PE	4286
	$C_9H_{14}NC_2H_5$ (9-Azabicyclo[3.3.1]nonane, 9-ethyl-)	64776-29-0	**	7.76 (V)	PE	5091
	$C_{10}H_{19}N$ (1-Azabicyclo[3.3.3]undecane)	31023-92-4	**	6.94 ± 0.09	PE	4497
$C_{10}H_{23}N^+$	$n-C_{10}H_{21}NH_2$	2016-57-1	**	8.63 ± 0.05	PI	5508
$C_{11}H_7N^+$	$C_{10}H_7CH$ (1-Naphthalenecarbonitrile)	86-53-3	**	8.61 (V)	PE	4466
	$C_{10}H_7CN$ (2-Naphthalenecarbonitrile)	613-46-7	**	8.64 (V)	PE	4466
$C_{11}H_{11}N^+$	$C_{11}H_9(NH_2)$ (1,4-Methanonaphthalene-5-amine, 1,4-dihydro-)	61346-80-3	**	7.84 ± 0.05 (V)	PE	5019
	$C_{11}H_9(NH_2)$ (1,4-Methanonaphthalene-6-amine, 1,4-dihydro-)	35391-95-8	**	7.60 ± 0.05	PE	5019
	$C_{10}H_8N(CH_3)$ (Naphthalen-1,4-imine, 1,4-dihydro-9-methyl-)	55258-00-9	**	8.18 ± 0.05 (V)	PE	4830
$C_{11}H_{13}N^+$	$C_{10}H_{10}N(CH_3)$ (Naphthalen-1,4-imine, 1,2,3,4-tetrahydro-9-methyl-)	55257-99-3	**	8.33 ± 0.05 (V)	PE	4830
	$C_6H_5(CN)C_4H_9$ (Benzonitrile, 3-butyl-)	20651-74-5	**	9.77 ± 0.1	EI	3629
	$C_6H_5(CN)C_4H_9$ (Benzonitrile, 4-butyl-)	20651-73-4	**	10.08 ± 0.1	EI	3629
	$C_{11}H_{13}N$ (2 <i>H</i> -1,4-Ethanoquinoline, 3,4-dihydro-)	4363-25-1	**	7.85 ± 0.02	PE	3890

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{11}H_{13}N^+$	$C_9H_7CH=NCH=C(CH_3)_2$ (2-Propen-1-amine, 2-methyl-N-(phenylmethylene)-(E)-)	68003-68-9	**	8.05 (V)	PE	4968
$C_{11}H_{17}N^+$	$C_7H_9N(tert-C_4H_9)$ (2-Azabicyclo[3.2.1]octa-3,6-diene,2-(1,1-dimethylethyl)-)	71017-51-1	**	7.06 (V)	PE	5481
	$C_6H_2(CH_3)_3N(CH_3)_2$ (Benzenamine, <i>N,N</i> ,2,4,6-pentamethyl-)	13021-15-3	**	7.24	PE	3988
$C_{11}H_{19}N^+$	$C_5H_{10}NC_6H_9$ (Piperidine, 1-(1-cyclohexen-1-yl)-)	2981-10-4	**	7.44 ± 0.03 (V)	PE	4452
$C_{11}H_{21}N^+$	$((CH_2)_5N)(C_6H_{11})$ (Piperidine, 1-cyclohexyl-)	3319-01-5	**	7.93 ± 0.03 (V)	PE	4452
	$C_7H_{12}N(tert-C_4H_9)$ (1-Azabicyclo[2.2.2]octane, 4-(1,1-dimethylethyl)-)	45980-26-5	**	7.97 ± 0.015 (V)	PE	4286
	$C_7H_{12}N(tert-C_4H_9)$ (2-Azabicyclo[3.2.1]octane,2-(1,1-dimethylethyl)-)	71017-52-2	**	8.30 (V)	PE	5481
	$C_9H_{11}NCH(CH_3)_2$ (9-Azabicyclo[3.3.1]nonane,9-(1-methylethyl)-)	64776-33-6	**	7.68 (V)	PE	5091
	$C_9H_{14}NCH_2CH_2CH_3$ (9-Azabicyclo[3.3.1]nonane,9-propyl-)	73320-99-7	**	7.71 (V)	PE	5091
$C_{12}H_9N^+$	$C_{11}H_9(CN)$ (1,4-Methanonaphthalene-5-carbonitrile, 1,4-dihydro-)	61346-79-0	**	8.94 ± 0.05	PE	5019
	$C_{11}H_9(CN)$ (1,4-Methanonaphthalene-6-carbonitrile, 1,4-dihydro-)	16513-60-3	**	8.94 ± 0.05 (V)	PE	5235
	$(C_6H_4)_2NH$ (9H-Carbazole)	86-74-8	**	8.87 ± 0.05 (V)	PE	5019
	$C_{11}H_9CN$ (1,4-Methanonaphthalene-2-carbonitrile, 1,4-dihydro-)	71906-57-5	**	7.50 (V)	PE	5619
	$C_{11}H_9CN$ (1,4-Methanonaphthalene-6-carbonitrile, 1,4-dihydro-)	16513-60-3	**	7.68 (V)	PE	4159
	$C_{12}H_9N$ (Pyrido[2,1,6- <i>de</i>]quinolizine)	519-61-9	**	8.77 ± 0.05 (V)	PE	5235
	$C_{11}H_9CN$ (1,4-Methanonaphthalene-6-carbonitrile, 1,4-dihydro-)	16513-60-3	**	8.77 (V)	PE	4835
	$C_{12}H_9N$ (Pyrido[2,1,6- <i>de</i>]quinolizine)	519-61-9	**	8.85 ± 0.05 (V)	PE	5235
$C_{12}H_{11}N^+$	$(C_6H_5)_2NH$ (Benzenamine, <i>N</i> -phenyl-)	122-39-4	**	7.14 ± 0.03	PI	4028
	$C_6H_5C_6H_4NH_2$ ([1,1'-Biphenyl]-2-amine)	90-41-5	**	7.18 ± 0.01	PE	4154
	$C_6H_5C_6H_4NH_2$ ([1,1'-Biphenyl]-2-amine)	90-41-5	**	7.44 (V)	PE	4159
	$C_6H_5C_6H_4NH_2$ ([1,1'-Biphenyl]-2-amine)	90-41-5	**	7.28 ± 0.02	PE	3702
$C_{12}H_{13}N^+$	$C_{10}H_7N(CH_3)_2$ (2-Naphthalenamine, <i>N,N</i> -dimethyl-)	2436-85-3	**	7.12 (V)	PE	4466
	$C_{10}H_7N(CH_3)_2$ (1-Naphthalenamine, <i>N,N</i> -dimethyl-)	86-56-6	**	7.59 (V)	PE	4466
	$C_{10}H_7N(CH_3)_2$ (1-Naphthalenamine, <i>N,N</i> -dimethyl-)	86-56-6	**	7.00 ± 0.02	PE	4143
$C_{12}H_{15}N^+$	$C_{12}H_{15}N$ (1 <i>H</i> ,5 <i>H</i> -Benzo[<i>ij</i>]quinolizine, 2,3,6,7-tetrahydro-)	479-59-4	**	6.65 ± 0.02	PE	3890

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{12}H_{23}N^+$	$C_8H_{14}NC(CH_3)_3$ (9-Azabicyclo[3.3.1]nonane, 9-(1,1-dimethylethyl)-)	64776-36-9	**	7.30 (V)	PE	5091
	$(n-C_4H_9)_3N$	102-82-9	**	6.98 ± 0.1	PE	4480
$C_{13}H_9N^+$	$C_{13}H_9N$ (Acridine)	260-94-6	**	7.8	PI	3586
			**	7.85 (V)	PE	5436
			**	7.88 ± 0.02 (V)	PE	4430
			**	8.13 ± 0.02 (V)	PE	4551
	$C_{13}H_9N$ (Benzo[<i>f</i>]quinoline)	85-02-9	**	8.14 ± 0.02 (V)	PE	4430
	$C_{13}H_9N$ (Benzo[<i>h</i>]quinoline)	230-27-3	**	8.04 ± 0.02 (V)	PE	4430
	$C_{13}H_9N$ (Phenanthridine)	229-87-8	**	8.31 ± 0.02 (V)	PE	4430
$C_{13}H_{10}N^+$	$C_6H_5C(=CH_2)C_5H_4N$ (Pyridine, 2-(1-phenylethenyl)-)	XXXXXX-XX-X H		9.5	EI	5570
	$C_6H_5C(=CH_2)C_5H_4N$ (Pyridine, 3-(1-phenylethenyl)-)	XXXXXX-XX-X H		9.9	EI	5570
	$C_6H_5C(=CH_2)C_5H_4N$ (Pyridine, 4-(1-phenylethenyl)-)	54813-56-8 H		10.0	EI	5570
	$C_6H_4(CH_3)C(=CH_2)C_5H_4N$ (Pyridine, 2-[1-(3-methylphenyl)ethenyl]-)	XXXXXX-XX-X CH ₃		9.7	EI	5570
	$C_6H_4(CH_3)C(=CH_2)C_5H_4N$ (Pyridine, 2-[1-(4-methylphenyl)ethenyl]-)	XXXXXX-XX-X CH ₃		9.8	EI	5570
	$C_6H_4FC(=CH_2)C_5H_4N$ (Pyridine, 2-[1-(2-fluorophenyl)ethenyl]-)	XXXXXX-XX-X F		9.5	EI	5570
	$C_6H_4ClC(=CH_2)C_5H_4N$ (Pyridine, 2-[1-(2-chlorophenyl)ethenyl]-)	XXXXXX-XX-X Cl		9.2	EI	5570
	$C_6H_4ClC(=CH_2)C_5H_4N$ (Pyridine, 2-[1-(4-chlorophenyl)ethenyl]-)	XXXXXX-XX-X Cl		9.9	EI	5570
	$C_6H_4BrC(=CH_2)C_5H_4N$ (Pyridine, 2-[1-(2-bromophenyl)ethenyl]-)	XXXXXX-XX-X Br		9.0	EI	5570
	$C_6H_4BrC(=CH_2)C_5H_4N$ (Pyridine, 2-[1-(4-bromophenyl)ethenyl]-)	XXXXXX-XX-X Br		9.7	EI	5570
	$C_6H_4IC(=CH_2)C_5H_4N$ (Pyridine, 2-[1-(2-iodophenyl)ethenyl]-)	XXXXXX-XX-X I		8.8	EI	5570
$C_{13}H_{11}N^+$	$C_{13}H_{11}N$ (Acridine, 9,10-dihydro-)	92-81-9	**	7.33 (V)	PE	4159
	$C_6H_5CH=NC_6H_5$ (Benzenamine, N-(phenylmethylene)-)	538-51-2	**	8.25 (V)	PE	4475
			**	8.27 ± 0.05 (V)	PE	4333
	$C_{12}H_8NCH_3$ (2H-Benz[<i>f</i>]isoindole, 2-methyl-)	59788-14-6	**	6.56 (V)	PE	4935
	$C_6H_5C(=CH_2)C_5H_4N$ (Pyridine, 2-(1-phenylethenyl)-)	XXXXXX-XX-X **		8.65	EI	5570
	$C_6H_5C(=CH_2)C_5H_4N$ (Pyridine, 3-(1-phenylethenyl)-)	XXXXXX-XX-X **		8.73	EI	5570
	$C_6H_5C(=CH_2)C_5H_4N$ (Pyridine, 4-(1-phenylethenyl)-)	54813-56-8	**	8.90	EI	5570
	$C_6H_5CH=CHC_5H_4N$ (Pyridine, <i>trans</i> -2-(2-phenylethenyl)-)	538-49-8	**	7.99 ± 0.05 (V)	PE	4377
	$C_6H_5CH=CHC_5H_4N$ (Pyridine, <i>trans</i> -3-(2-phenylethenyl)-)	5097-91-6	**	8.10 ± 0.05 (V)	PE	4377

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{13}H_{11}N^+$	$C_6H_5CH=CHC_5H_4N$ (Pyridine, <i>trans</i> -4-(2-phenylethenyl)-)	5097-93-8	**	8.34 ± 0.05 (V)	PE	4377
$C_{13}H_{12}N^+$	$(C_6H_5NH_2)_2CH_2$ (Benzenamine, 4,4'-methylenebis-)	101-77-9	NH_2	10.7 ± 0.1	EI	3807
$C_{13}H_{13}N^+$	$(C_6H_5)_2NCH_3$ (Benzenamine, N-methyl-N-phenyl-)	552-82-9	**	6.94 ± 0.03	PI	5552
	$C_6H_5CH_2C_6H_4NH_2$ (Benzenamine, 4-(phenylmethyl)-)	1135-12-2	**	7.33 (V)	PE	4159
			**	7.67 ± 0.05	EI	3806
$C_{13}H_{17}N^+$	$C_7H_{12}NC_6H_5$ (1-Azabicyclo[2.2.2]octane, 4-phenyl-)	51069-11-5	**	8.13 ± 0.015 (V)	PE	4286
$C_{11}H_9N^+$	C_4H_5N (Cyclopent[4,5]azepino[2,1,7- <i>cd</i>]pyrrolizine)	27884-38-4	**	7.06 (V)	PE	4812
$C_{11}H_{11}N^+$	$C_{13}H_8NCH_3$ (Acridine, 9-methyl-)	611-64-3	**	7.68 (V)	PE	5436
	$C_6H_5CH_2C_6H_4CN$ (Benzonitrile, 4-(phenylmethyl)-)	23450-31-9	**	9.25 ± 0.05	EI	3806
	$C_{11}H_{11}N$ (5H-Dibenzo [<i>b,f</i>]azepine)	256-96-2	**	6.78	PE	4611
$C_{11}H_{13}N^+$	$C_6H_5N=CHC_6H_4CH_3$ (Benzenamine, N-[(3-methylphenyl)methylene]-)	6906-25-8	**	8.07 (V)	PE	5486
	$C_{11}H_{13}N$ (5H-Dibenzo [<i>b,f</i>]azepine, 10,11-dihydro-)	494-19-9	**	7.25 (V)	PE	4159
	$C_6H_4(CH_3)C(=CH_2)C_5H_4N$ (Pyridine, 2-[1-(3-methylphenyl)ethenyl]-)	XXXXX-XX-X	**	8.48	EI	5570
	$C_6H_4(CH_3)C(=CH_2)C_5H_4N$ (Pyridine, 2-[1-(4-methylphenyl)ethenyl]-)	XXXXX-XX-X	**	8.45	EI	5570
	$C_6H_4(CH_3)CH=CHC_5H_4N$ (Pyridine, <i>trans</i> -3-[2-(4-methylphenyl)ethenyl]-)	6892-33-7	**	7.90 ± 0.05 (V)	PE	4377
	$C_6H_5CH=C(CH_3)C_5H_4N$ (Pyridine, <i>trans</i> -4-(1-methyl-2-phenylethenyl)-)	18150-12-4	**	8.39 ± 0.05 (V)	PE	4377
	$C_6H_4(CH_3)N=CHC_6H_5$ (Benzenamine, 2-methyl-N-(phenylmethylene)-)	5877-55-4	**	8.06 (V)	PE	5486
	$C_6H_4(CH_2CH_2)_2C_4H_2NH$ (15-Azatricyclo[8.2.2.1 ^{1,7}]pentadeca-4,6,10,12,13-pentaene)	51053-69-1	**	7.26	PE	5575
	$C_6H_5CH_2CH_2C_6H_4NH_2$ (Benzenamine, 4-(2-phenylethyl)-)	13024-49-2	**	7.55 ± 0.05	EI	3806
$C_{15}H_9N^+$	$C_{11}H_9CN$ (9-Anthracenecarbonitrile)	1210-12-4	**	7.80 ± 0.03 (V)	PE	4887
$C_{15}H_{11}N^+$	$C_{11}H_8N(CH_3)$ (Cyclopenta[<i>ij</i>]pyrido[2,1,6- <i>de</i>]quinolizine, 3-methyl-)	21533-76-6	**	6.37 (V)	PE	4812
	$C_{15}H_{11}N$ (16-Azatricyclo[9.2.2.1 ^{1,8}]hexadeca-2,4,6,8(16),9,11,13,14-octaene)	1647-34-8	**	8.03 (V)	PE	4824

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{15}H_{11}N^+$	$C_9H_6NC_6H_5$ (Quinoline, 2-phenyl-)	612-96-4	**	8.10	PE	4066
$C_{15}H_{15}N^+$	$C_{15}H_{15}N$ (16-Azatricyclo[9.2.2.1 ^{4,8}]hexadeca-4,6,8(16),11,13,14-hexaene) $C_6H_3(CH_2CH_2)_2C_5H_5N$ (5-Azatricyclo[8.2.2.2 ^{4,7}]hexadeca-4,6,10,12,13,15-hexaene) $C_6H_3(CH_3)N=CHC_6H_4CH_3$ (Benzenamine,2-methyl-N-[(3-methylphenyl)methylene]-) $C_6H_3(CH_3)_2N=CHC_6H_5$ (Benzenamine,2,6-dimethyl-N-(phenylmethylene)-)	42082-72-4	**	8.05 (V)	PE	4824
		37877-95-5	**	8.20 (V)	PE	5575
		33629-97-9	**	8.00 (V)	PE	5486
		3096-95-5	**	8.00 (V)	PE	5486
$C_{16}H_{13}N^+$	$C_{15}H_{10}N(CH_3)$ (16-Azatricyclo[9.2.2.1 ^{4,8}]hexadeca-2,4,6,8(16),9,11,13,14-octaene, 6-methyl-) $C_{14}H_7N(CH_3)_2$ (Cyclopent[4,5]azepino[2,1,7-cd]pyrrolizine,6,8-dimethyl-) $C_6H_3(CN)(C_6H_5)_2$ (Cyclopropanecarbonitrile, 1,2-diphenyl-)	70389-17-2	**	7.92 (V)	PE	4824
		65738-45-6	**	6.99 (V)	PE	4812
		10224-14-3	**	8.80±0.08	EI	3575
$C_{16}H_{15}N^+$	$C_{14}H_9N(CH_3)_2$ (3H-Indole, 3,3-dimethyl-2-phenyl-)	6636-32-4	**	8.10 (V)	PE	4421
$C_{16}H_{17}N^+$	$C_{15}H_{14}N(CH_3)$ (16-Azatricyclo[9.2.2.1 ^{4,8}]hexadeca-4,6,8(16),11,13,14-hexaene, 6-methyl-) $C_6H_3(CH_3)_2N=CHC_6H_4CH_3$ (Benzamine,2,6-dimethyl-N-[(3-methylphenyl)methylene]-) $C_{10}H_{15}NH_2$ (Tricyclo[8.2.2.2 ^{4,7}]hexadeca-4,6,10,12,13,15-hexaen-5-amine)	70389-16-1	**	8.06 (V)	PE	4824
		57387-52-7	**	7.90 (V)	PE	5486
		10122-95-9	**	6.90	PE	4158
$C_{17}H_{13}N^+$	$C_{16}H_{10}NCH_3$ (2H-Dibenz[e,g]isoindole, 2-methyl-)	59788-15-7	**	7.15 (V)	PE	4935
$C_{17}H_{15}N^+$	$C_{15}H_{10}N(CH_3)_2$ (16-Azatricyclo[9.2.2.1 ^{4,8}]hexadeca-2,4,6,8(16),9,11,13,14-octaene, 12,14-dimethyl-)	64000-97-1	**	7.67 (V)	PE	4824
$C_{17}H_{19}N^+$	$C_{15}H_{13}N(CH_3)_2$ (16-Azatricyclo[9.2.2.1 ^{4,8}]hexadeca-4,6,8(16),11,13,14-hexaene, 12,14-dimethyl-)	70389-13-8	**	7.70 (V)	PE	4824
$C_{17}H_{29}N^+$	$C_5H_2N(C(CH_3)_3)_3$ (Pyridine, 2,4,6-tris(1,1-dimethylethyl)-)	20336-15-6	**	8.6 (V)	PE	3685
			**	8.6 (V)	PE	3934
$C_{18}H_{15}N^+$	$(C_6H_5)_3N$ (Benzenamine, N,N-diphenyl-)	603-34-9	**	7.00±0.05 (V)	PE	4368
			**	6.80±0.05	PI	4028
			**	6.75±0.01	PE	4154

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{18}H_{17}N^+$	$C_{10}H_6(CH_2CH_2)_2C_4H_2NH$ (5,14-Ethenobenzocyclododecen-8,11-imine,6,7,12,13-tetrahydro-)	73650-66-5	**	7.35 (V)	PE	5575
$C_{18}H_{27}N^+$	$C_{10}H_{14}NC_6H_4C(CH_3)_3$ (9-Azabicyclo[3.3.1]nonane,9-[4-(1,1-dimethylethyl)phenyl])	XXXXX-XX-X	**	6.94 (V)	PE	5091
$C_{19}H_{13}N^+$	$C_{13}H_8NC_6H_5$ (Acridine,9-phenyl-)	602-56-2	**	7.75 (V)	PE	5436
			**	7.80 (V)	PE	5630
	$C_{13}H_8NC_6H_5$ (Phenanthridine, 6-phenyl-)	2720-93-6	**	8.20 (V)	PE	4262
$C_{19}H_{19}N^+$	$C_{15}H_7N(CH_3)_4$ (16-Azatricyclo[9.2.2.1 ^{4,8}]hexadeca-2,4,6,8(16),9,11,13,14-octaene, 12,13,14,15-tetramethyl-)	64000-98-2	**	7.54 (V)	PE	4824
$C_{19}H_{23}N^+$	$C_{15}H_{11}N(CH_3)_4$ (16-Azatricyclo[9.2.2.1 ^{4,8}]hexadeca-4,6,8(16),11,13,14-hexaene, 12,13,14,15-tetramethyl-)	70389-15-0	**	7.57 (V)	PE	4824
$C_{20}H_{23}N^+$	$C_{15}H_{12}=CHCH_2CH_2N(CH_3)_2$ (1-Propanamine, 3-(10,11-dihydro-5H-dibenzo[a,d]cyclohepten-5-ylidene)-N,N-dimethyl-)	50-48-6	**	8.26±0.07	CTS	4079
$CH_2N_2^+$	CH_3N_2	334-88-3	**	9.00	PE	4595
	$H_2NC\equiv N$	420-04-2		10.65 (V)	PE	4294
	CH_2N_2 (3H-Diazirine)	157-22-2	**	10.3	PE	3727
$CH_3N_2^+$	$CH_3N=NCH_3$	503-28-6	CH_3	9.2	EI	3632
	<i>trans</i> - $CH_3N=NCH_3$	4143-41-3	CH_3	9.20±0.03	PI	4342
$CH_4N_2^+$	$CH_3N=NH$	XXXXX-XX-X	**	8.8±0.1	PE	4587
$CH_6N_2^+$	$H_2NNH(CH_3)$	60-34-4	**	9.34 (V)	PE	5381
			**	8.40±0.05	PE	4521
			**	9.32 (V)	PE	4137
			**	9.36 (V)	PE	4514
$C_2H_4N_2^+$	$CH_2=NN=CH_2$	503-27-5	**	8.95	PE	4499
$C_2H_6N_2^+$	$(CH_3N)_2$	503-28-6	**	8.30	PE	4587
			**	8.95±0.05 (V)	PE	4614
			**	9.0 (V)	PE	4467
	<i>trans</i> - $CH_3N=NCH_3$	4143-41-3	**	8.45±0.05	PI	4342
			**	8.20	PE	3649
$C_2H_8N_2^+$	$(CH_3)_2NNH_2$	57-14-7	**	8.05±0.05	PE	4521
			**	8.82 (V)	PE	5381
			**	8.85 (V)	PE	4514

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_2H_8N_2^+$	$(CH_3)_2NNH_2$	57-14-7	**	8.88 (V)	PE	4137
	$(CH_3NH)_2$	540-73-8	**	9.00 (V)	PE	4137
			**	9.02 (V)	PE	5068
			**	9.02 (V)	PE	5381
			**	9.62	PE	3747
	$C_2H_5NHNH_2$	624-80-6	**	8.12 ± 0.05	PE	4521
			**	9.20 (V)	PE	4137
$C_3H_2N_2^+$	$CH_3(CN)_2$	109-77-3	**	12.88	PE	4067
$C_3H_3N_2^+$	$C_3H_1N_2$ (1H-Imidazole)	288-32-4	H	12.8	EI	3910
$C_3H_1N_2^+$	$C_3H_1N_2$ (1H-Imidazole)	288-32-4	**	8.96 (V)	PE	5092
			**	8.78 (V)	PE	4009
			**	9.12	EI	3910
	$C_3H_1N_2$ (1H-Pyrazole)	288-13-1	**	9.15 (V)	PE	5213
			**	9.15 (V)	PE	4009
$C_3H_6N_2^+$	$(CH_3)_2NC \equiv N$	1467-79-4		9.44 (V)	PE	4294
	$(CH_3)_2C = N = N$	2684-60-8	**	7.88	PE	4047
	$C_3H_6N_2$ (3H-Diazirine, 3,3-dimethyl-)	5161-49-9	**	9.76 (V)	PE	3505
$C_3H_8N_2^+$	$(CH_3)_2NN = CH_2$	2035-89-4	**	7.85	PE	3884
	$CH_3NHN = CHCH_3$	17167-73-6	**	7.67	PE	3884
	$C_3H_6NNH_2$ (1-Azetidinamine)	53779-89-8	**	8.828 (V)	PE	4156
	$CH_2N_2(CH_3)_2$ (Diaziridine, 1,2-dimethyl-)	6794-95-2	**	9.42 (V)	PE	3888
			**	9.42 (V)	PE	4277
	$CH_2N_2(CH_3)_2$ (Diaziridine, 3,3-dimethyl-)	4901-76-2	**	9.90 (V)	PE	3888
	$C_3H_8N_2$ (Pyrazolidine)	504-70-1	**	7.90 (V)	PE	4085
			**	9.16 (V)	PE	4134
$C_3H_{10}N_2^+$	$(CH_3)_2NNH(CH_3)$	1741-01-1	**	8.74 (V)	PE	5381
			**	8.67 (V)	PE	4137
	<i>n</i> - $C_3H_7NHNH_2$	5039-61-2	**	9.07 (V)	PE	4137
	<i>iso</i> - $C_3H_7NHNH_2$	2257-52-5	**	8.42 ± 0.05	PE	4521
			**	9.05 (V)	PE	4137
$C_4H_2N_2^+$	<i>cis</i> - $CH(CN) = CH(CN)$	928-53-0	**	11.15	PE	3778
	<i>trans</i> - $CH(CN) = CH(CN)$	764-42-1	**	11.15	PE	3778
			**	11.16 ± 0.03	PI	5505
	$C(CN)_2 = CH_2$	922-64-5	**	11.38 ± 0.05 (V)	PE	4859
$C_4H_1N_2^+$	$C_4H_1N_2$ (Pyrazine)	290-37-9	**	9.28 ± 0.01	S	3773

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_4H_4N_2^+$	$C_4H_4N_2$ (Pyrazine)	290-37-9	**	9.29	PE	3679
			**	9.63 (V)	PE	3513
			**	9.63 (V)	PE	4330
	$C_4H_4N_2$ (Pyridazine)	289-80-5	**	8.64	PE	3679
			**	8.706 ± 0.001	PE	3639
			**	9.31 (V)	PE	3513
			**	9.31 (V)	PE	4330
	$C_4H_4N_2$ (Pyrimidine)	289-95-2	**	9.23	PE	3679
			**	9.32 ± 0.01	PE	3651
			**	9.73 ± 0.03 (V)	PE	4445
			**	9.73 (V)	PE	3513
			**	9.73 (V)	PE	4330
			**			
$C_4H_6N_2^+$	$C_4H_6N_2$ (1H-Imidazole, 1-methyl-)	616-47-7	**	8.66 (V)	PE	5092
	$C_4H_6N_2$ (1H-Imidazole, 2-methyl-)	693-98-1	**	8.50 (V)	PE	5092
	$C_4H_4NNH_2$ (1H-Pyrrol-1-amine)	765-39-9	**	8.36 (V)	PE	5387
	$(CH_3CH=NN)_2$	XXXXX-XX-X	**	8.56	PE	5589
$C_4H_8N_2^+$	$C_4H_8N_2(CH_3)$ (1H-Imidazole, 4,5-dihydro-2-methyl-)	534-26-9	**	8.56 (V)	PE	5096
	$CH_3CH=NN=CHCH_3$	592-56-3	**	8.50	PE	4499
			**	8.56	PE	4043
			**	9.1 (V)	PE	4814
			**	9.11 (V)	PE	4085
			**	11.62 (V)	PE	5381
	$(CH_3)_2NCH_2CN$	926-64-7	**	8.72 ± 0.05	PE	4192
	$C_2H_5NC_2H_4N$ (1,1'-Biaziridine)		**	8.65 (V)	PE	4085
			**	11.16 (V)	PE	5381
$C_4H_{10}N_2^+$	$C_2H_5N=NC_2H_5$	821-14-7	**	8.7 ± 0.1	EI	4099
	$CH_3NHN=C(CH_3)_2$		**	7.69	PE	3884
	$(CH_3)_2NN=CHCH_3$	7422-90-4	**	7.54	PE	3884
	<i>trans</i> - $C_2H_5N=NC_2H_5$		**	8.77 (V)	PE	4429
	$C_2H_4N_2(CH_3)_2$ (1,2-Diazetidene, 1,2-dimethyl-)	52433-27-9	**	7.95 (V)	PE	4277
	$C_2H_4N_2(CH_3)_2$ (1,2-Diazetidene, 1,2-dimethyl- <i>trans</i> -)	67144-62-1	**	8.12 (V)	PE	4780
	$CHN_2(CH_3)_3$ (Diaziridine, 1,3,3-trimethyl-)	40711-15-7	**	9.20 (V)	PE	3888
	$C_4H_{10}N_2$ (Piperazine)	110-85-0	**	8.72 (V)	PE	4085
			**	8.98 (V)	PE	4141
	$C_4H_{10}N_2$ (Pyridazine, hexahydro-)	505-19-1	**	8.64 (V)	PE	4134
	$C_4H_8NNH_2$ (1-Pyrrolidinamine)	16596-41-1	**	8.681 (V)	PE	4156
$C_4H_{12}N_2^+$	$(C_2H_5)_2NNH_2$	616-40-0	**	7.96 ± 0.05	PE	4521
	$(NH(C_2H_5))_2$		**	8.81 (V)	PE	5381
		6415-12-9	**	8.88 (V)	PE	4085
	$((CH_3)_2N)_2$		**	8.27	PE	5280

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_4H_{12}N_2^+$	$((CH_3)_2N)_2$	6415-12-9	**	8.27 (V)	PE	4137
			**	8.27 (V)	PE	5504
			**	8.38 (V)	PE	4085
			**	8.43 (V)	PE	3889
			**	8.55 (V)	PE	4156
	<i>n</i> - $C_4H_9NHNH_2$	3530-11-8	**	9.04 (V)	PE	4137
	<i>tert</i> - $C_4H_9NHNH_2$	32064-67-8	**	8.92 (V)	PE	4137
$C_5H_4N_2^+$	$C_5H_4N_2$ (1,3-Cyclopentadiene, 5-diazo-)	1192-27-4	**	8.09 ± 0.01	PE	4250
			**	8.33 (V)	PE	4047
$C_5H_6N_2^+$	$CH_3C(CN)_2CH_3$	7321-55-3	**	12.39 (V)	PE	4067
			**	8.34 (V)	PE	4240
	$C_5H_4NNH_2$ (2-Pyridinamine)	504-29-0	**	8.5 ± 0.1	EI	4302
			**	8.85 ± 0.05	EI	3891
			**	9.3	CTS	3730
			**	8.44 (V)	PE	4240
	$C_5H_4NNH_2$ (3-Pyridinamine)	462-08-8	**	8.7 ± 0.1	EI	4302
			**	9.03 ± 0.05	EI	3891
			**	9.0	CTS	3730
			**	8.76 (V)	PE	4240
	$C_5H_4NNH_2$ (4-Pyridinamine)	504-24-5	**	8.77 (V)	PE	5527
			**	8.8 ± 0.1	EI	4302
			**	9.27 ± 0.05	EI	3891
			**	8.4	CTS	3730
			**	8.45 ± 0.04	PE	3828
			**	8.82 (V)	PE	4135
$C_5H_8N_2^+$	$C_5H_8N_2$ (2,3-Diazabicyclo[2.2.1]hept-2-ene)	2721-32-6	**	8.94 (V)	PE	4429
			**	8.38 (V)	PE	5092
	$C_5H_8N_2$ (1H-Imidazole, 1,2-dimethyl-)	1739-84-0	**			
			**			
$C_5H_{10}N_2^+$	$C_5H_7N_2CH_3$ (1,5-Diazabicyclo[3.1.0]hexane, 2-methyl-)	6794-96-3	**	8.78 (V)	PE	3888
			**			
$C_5H_{12}N_2^+$	$(CH_3)_2NN=C(CH_3)_2$	13483-31-3	**	7.43	PE	3884
			**	7.70 (V)	PE	4780
	$C_5H_6N_2(CH_3)_2$ (1-Azetidinamine, N,N-dimethyl-)	67092-88-0	**			
			**	8.94 (V)	PE	3888
	$CN_3(CH_3)_4$ (Diaziridine, tetramethyl-)	50695-43-7	**			
			**	8.631 (V)	PE	4156
	$C_5H_{10}NNH_2$ (1-Piperidinamine)	2213-43-6	**			
			**	7.78	PE	5280
	$C_5H_6N_2(CH_3)_2$ (Pyrazolidine, 1,2-dimethyl-)	38704-89-1	**	7.90 (V)	PE	4277
			**	8.33 (V)	PE	4134
			**	9.05 (V)	PE	4277

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₅H₁₁N₂⁺	((CH ₃) ₂ N) ₂ CH ₂	XXXXX-XX-X	••	7.74±0.05	PE	4192
	(C ₂ H ₅ (CH ₃)NN(CH ₃) ₂)	50599-41-2	••	8.18	PE	5280
			••	8.18 (V)	PE	4137
	<i>n</i> -C ₄ H ₉ N(CH ₃)NH ₂	20240-62-4	••	7.82±0.05	PE	4521
	<i>iso</i> -C ₃ H ₇ NHN(CH ₃) ₂	5824-85-1	••	8.52 (V)	PE	4137
C₆H₆N₂⁺	C ₅ H ₄ NCN (2-Pyridinecarbonitrile)	100-70-9	••	10.12 (V)	PE	4240
			••	10.33±0.05	EI	3498
			••	10.33	EI	5292
			••	10.5±0.1	EI	4302
	C ₅ H ₄ NCN (3-Pyridinecarbonitrile)	100-54-9	••	10.10 (V)	PE	4240
			••	10.37 (V)	PE	5527
			••	10.4±0.1	EI	4302
	C ₅ H ₄ NCN (4-Pyridinecarbonitrile)	100-48-1	••	10.30 (V)	PE	4240
			••	10.7 (V)	PE	5527
			••	10.4±0.1	EI	4302
C₆H₆N₂⁺	C ₆ H ₄ (NH) ₂ (2,5-Cyclohexadiene,1,4-diimine)	4377-73-5	••	9.36±0.03	PI	5552
		34122-54-8	••	8.54 (V)	PE	4135
	C ₆ H ₆ N ₂ (7,8-Diazatetracyclo[3.3.0.0 ^{2,4} .0 ^{3,6}]oct-7-ene)					
C₆H₇N₂⁺	C ₆ H ₄ (NH ₂)NHCOCH ₃ (Acetamide, <i>N</i> -(2-aminophenyl)-)	34801-09-7	CH ₃ CO	13.93±0.02	EI	3631
		122-80-5	CH ₃ CO	13.72±0.02	EI	3631
	C ₆ H ₄ (NH ₂)NHCOCH ₃ (Acetamide, <i>N</i> -(4-aminophenyl)-)					
C₆H₈N₂⁺	C ₆ H ₄ (NH ₂) ₂ (1,2-Benzenediamine)	95-54-5	••	7.2	PE	4201
			••	7.69 (V)	PE	5474
			••	7.78 (V)	PE	4893
	C ₆ H ₄ (NH ₂) ₂ (1,3-Benzenediamine)	108-45-2	••	7.14	PI	4328
			••	7.44	PE	4201
			••	7.60 (V)	PE	5474
			••	7.74 (V)	PE	4893
	C ₆ H ₄ (NH ₂) ₂ (1,4-Benzenediamine)	106-50-3	••	6.89±0.03	PI	5552
			••	6.84	PE	4201
			••	7.34 (V)	PE	5474
			••	7.61 (V)	PE	4893
			••	7.16	EI	4089
			••	7.86 (V)	PE	5474
	C ₆ H ₅ NHNH ₂ (Phenylhydrazine)	100-63-0	••			
	C ₄ H ₂ N ₂ (CH ₃) ₂ (Pyrazine, 2,6-dimethyl-)	108-50-9	••	8.80	PE	3860
	C ₅ NH ₄ (CH ₃)NH ₂ (2-Pyridinamine, 6-methyl-)	1824-81-3	••	9.1	CTS	3730
	C ₅ H ₄ NNHCH ₃ (2-Pyridinamine, <i>N</i> -methyl-)	4597-87-9	••	8.26±0.05	EI	3891

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_6H_8N_2^+$	$C_5NH_3(CH_3)NH_2$ (3-Pyridinamine, 4-methyl-)	3430-27-1	**	9.3	CTS	3730
	$C_5H_4NNHCH_3$ (3-Pyridinamine, <i>N</i> -methyl-)	18364-47-1	**	8.53 ± 0.05	EI	3891
	$C_5H_4NNHCH_3$ (4-Pyridinamine, <i>N</i> -methyl-)	1121-58-0	**	8.75 ± 0.05	EI	3891
	$C_5H_3N(NH)CH_3$ (2(1 <i>H</i>)-Pyridinimine, 1-methyl-)	4088-63-5	**	7.91 ± 0.05	EI	3891
	$C_5H_3N(NH)CH_3$ (4(1 <i>H</i>)-Pyridinimine, 1-methyl-)	16562-40-6	**	7.85 ± 0.05	EI	3891
	$C_5H_4N(NH)CH_3$ (Pyridinium, 3-amino-1-methyl-, hydroxides, inner salt)	38879-42-2	**	7.45 ± 0.1	EI	3891
	$C_6H_4(NH_2)NHC(=O)CH_3$ (Acetamide, <i>N</i> -(2-aminophenyl)-)	34801-09-7	$CH_2=C=O$	10.49 ± 0.02	EI	3631
	$C_6H_4(NH_2)NHC(=O)CH_3$ (Acetamide, <i>N</i> -(4-aminophenyl)-)	122-80-5	$CH_2=C=O$	10.06 ± 0.02	EI	3631
$C_6H_{10}N_2^+$	$C_6H_{10}N_2$ (2,3-Diazabicyclo[2.2.2]oct-2-ene)	3310-62-1	**	7.79 ± 0.04	PE	3828
$C_6H_{12}N_2^+$	$(CH_3)_2C=NN=C(CH_3)_2$	627-70-3	**	7.97	PE	4043
			**	8.6	PE	4814
	$(C_2H_5CH=N)_2$	15601-98-6	**	9.0 (V)	PE	4814
	$(C_3H_6N)_2$ (1,1-Biazetidine)	67092-91-5	**	8.2 (V)	PE	4780
	$C_6H_{12}N_2$ (1,2-Diazabicyclo[2.2.2]octane)	329-94-2	**	8.52 (V)	PE	4134
	$C_6H_{12}N_2$ (1,4-Diazabicyclo[2.2.2]octane)	280-57-9	**	7.20	PI	5045
			**	7.52 ± 0.02 (V)	PE	4480
			**	7.52 (V)	PE	4038
			**	7.609	PE	4214
			**	7.61 (V)	PE	4141
			**	7.70 (V)	PE	5623
	$C_6H_{12}N_2$ (1,5-Diazabicyclo[3.2.1]octane)	280-28-4	**	8.24 (V)	PE	5623
			**	8.89 (V)	PE	4141
	$C_6H_{12}N_2$ (1,5-Diazabicyclo[3.3.0]octane)	XXXXX-XX-X	**	7.87 (V)	PE	5504
	$C_2N_2(CH_3)_4$ (1,2-Diazete, 3,4-dihydro-3,3,4,4-tetramethyl-)	54166-22-2	**	8.87 (V)	PE	4651
	$C_3H_6N_2C_3H_6$ (1 <i>H</i> ,5 <i>H</i> -Pyrazolo[1,2- <i>a</i>]pyrazole,tetrahydro-)	5397-67-1	**	7.87	PE	5280
			**	7.90 (V)	PE	5381
			**	7.87 (V)	PE	4134
			**	7.91 (V)	PE	3889
	$C_4H_6N_2(CH_3)_2$ (Pyridazine, 1,2,3,6-tetrahydro-1,2-dimethyl-)	26163-36-0	**	8.89 (V)	PE	4277
			**	8.12 (V)	PE	4134
$C_6H_{14}N_2^+$	$CH_2=C(N(CH_3)_2)_2$	815-62-3	**	7.5 (V)	PE	4291
	<i>cis</i> -(<i>iso</i> - C_3H_7) ₂ N=N	23201-84-5	**	8.24 (V)	PE	4429
	<i>trans</i> - $C_3H_7N=NC_3H_7$	55204-42-7	**	8.61 (V)	PE	4429
	<i>trans</i> -(<i>iso</i> - C_3H_7) ₂ N=N	15464-00-3	**	8.47 (V)	PE	4429
	$C_4H_8N_2(CH_3)_2$ (Piperazine, 1,4-dimethyl-)	106-58-1	**	8.77 (V)	PE	4141

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_6H_{14}N_2^+$	$C_4H_8N_2(CH_3)_2$ (Pyridazine, hexahydro-1,2-dimethyl-)	26163-37-1	**	7.77 (V)	PE	3887
			**	7.78 (V)	PE	4277
			**	7.78 (V)	PE	5353
			**	7.81 (V)	PE	5280
			**	7.81 (V)	PE	4134
			**	8.57 (V)	PE	4277
	$C_4H_8N_2(CH_3)_2$ (Pyrimidine, hexahydro-1,3-dimethyl-)	10556-96-4	**	8.11 (V)	PE	4141
	$C_4H_8NN(CH_3)_2$ (1-Pyrrolidinamine, N,N-dimethyl-)	53779-90-1	**	7.97	PE	5280
$C_6H_{16}N_2^+$	$(CH_3)_2NCH_2CH_2N(CH_3)_2$	51-80-9	**	7.61±0.05	PE	4192
	$(C_3H_5NH_2)_2$	124-09-4	**	7.52 (V)	PE	5538
	$(NH(C_3H_7))_2$	1615-83-4	**	8.62 (V)	PE	5381
	$(C_2H_5)_2NN(CH_3)_2$	21849-74-1	**	8.10	PE	5280
			**	8.10 (V)	PE	4137
	$((C_2H_5)(CH_3)N)_2$	23337-93-1	**	8.08	PE	5280
	$(n-C_3H_7)_2NNH_2$	4986-50-9	**	8.51	PE	4137
	$(n-C_3H_7)(CH_3)NN(CH_3)_2$	60678-65-1	**	8.14	PE	5280
	$(NH(iso-C_3H_7))_2$	3711-34-0	**	8.45 (V)	PE	5381
			**	8.34 (V)	PE	4085
			**	8.59 (V)	PE	4137
	$(iso-C_3H_7)(CH_3)NN(CH_3)_2$	49840-63-3	**	8.09	PE	5280
			**	8.09 (V)	PE	4137
$C_7H_6N_2^+$	$C_6H_5CHN_2$ (Benzene, (diazomethyl)-)	766-91-6	**	7.72±0.02 (V)	PE	4674
	$C_7H_6N_2$ (1H-Benzimidazole)	51-17-2	**	8.44 (V)	PE	5092
			**	8.45 (V)	PE	5396
	$C_7H_6N_2$ (Imidazo[1,2- <i>a</i>]pyridine)	274-76-0	**	8.19 (V)	PE	4812
	$C_6H_4CHN_2H$ (1H-Indazole)	271-44-3	**	8.35 (V)	PE	5396
$C_7H_8N_2^+$	$C_7H_8N_2$ (3,4-Diazatricyclo[4.2.1.0 ^{2,5}]nona-3,7-diene)	23979-29-5	**	9.05±0.05 (V)	PE	4040
	$C_7H_8N_2$ (3,5,6-Methenocyclopentapyrazole, 3,3a,4,5,6,6a-hexahydro-)	16104-45-3	**	8.23±0.05	PE	4449
			**	8.65 (V)	PE	4135
$C_7H_{10}N_2^+$	$C_7H_{10}N_2$ (3,4-Diazatricyclo[4.2.1.0 ^{2,5}]non-3-ene)	23979-30-8	**	8.90±0.05 (V)	PE	4040
	$C_5H_4NN(CH_3)_2$ (4-Pyridinamine, N,N-dimethyl-)	1122-58-3	**	7.82 (V)	PE	5527
			**	8.3±0.1	EI	4302
	$C_5H_4NN(CH_3)_2$ (2-Pyridinamine, N,N-dimethyl-)	5683-33-0	**	7.8±0.1	EI	4302
			**	7.7	CTS	3730
$C_7H_{12}N_2^+$	$C_5H_6N_2(CH_3)_2$ (2,3-Diazabicyclo[2.2.1]hept-5-ene, 2,3-dimethyl-)	14288-15-4	**	7.63 (V)	PE	4277
			**	7.63 (V)	PE	5353
			**	7.72 (V)	PE	4134
			**	7.74 (V)	PE	3889

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_7H_{12}N_2^+$	$C_7H_{12}N_2$ (6,7-Diazabicyclo[3.2.2]non-6-ene)	43195-77-3	**	7.64 ± 0.04	PE	3828
	$C_3N_2(CH_3)_4$ (4H-Pyrazole,3,4,4,5-tetramethyl-)	19078-32-1	**	9.57 (V)	PE	5381
			**	10.12 (V)	PE	4085
$C_7H_{14}N_2^+$	$C_5H_8N_2(CH_3)_2$ (2,3-Diazabicyclo[2.2.1]heptane, 2,3-dimethyl-)	14287-89-9	**	7.48 (V)	PE	4277
			**	7.48 (V)	PE	5353
			**	7.58 (V)	PE	3889
			**	7.66 (V)	PE	5280
	$C_5H_8N_2(CH_3)_2$ (2,3-Diazabicyclo[2.2.1]heptane, 2,3-dimethyl-, (2- <i>endo</i> ,3- <i>exo</i>)-)	53798-46-2	**	7.66 (V)	PE	4134
	$C_7H_{14}N_2$ (1,5-Diazabicyclo[3.2.2]nonane)	283-47-6	**	7.43 (V)	PE	4141
	$C_7H_{14}N_2$ (1,5-Diazabicyclo[3.3.1]nonane)	281-17-4	**	7.75 (V)	PE	4141
	$C_6H_{11}N_2CH_3$ (1,2-Diazabicyclo[2.2.2]octane, 2-methyl-)	6523-29-1	**	8.02 (V)	PE	4134
	$C_3H_2N_2(CH_3)_4$ (3H-Pyrazole, 4,5-dihydro-3,3,5,5-tetramethyl-)	2721-31-5	**	8.63 (V)	PE	4429
	$C_4H_8N_2C_3H_6$ (1H-Pyrazolo[1,2- <i>a</i>]pyridazine, hexahydro-)	5721-43-7	**	7.63	PE	5280
			**	7.63 (V)	PE	4134
	$C_4H_5N_2(CH_3)_3$ (Pyridazine, 1,2,3,6-tetrahydro-1,2,3-trimethyl-)	38704-94-8	**	8.08 (V)	PE	4134
$C_7H_{16}N_2^+$	$C_5H_{10}N_2(CH_3)_2$ (1H-1,2-Diazepin, hexahydro-1,2-dimethyl-)	49840-68-8	**	7.88	PE	5280
	$C_3H_4N_2(CH_3)_4$ (Imidazolidine, 1,2,2,3-tetramethyl-)	33709-65-8	**	7.85 (V)	PE	5477
	$C_5H_{10}NN(CH_3)_2$ (1-Piperidinamine, N,N-dimethyl-)	49840-60-0	**	8.09	PE	5280
	$C_3H_6N_2(C_2H_5)_2$ (Pyrazolidine, 1,2-diethyl-)	22825-58-7	**	8.06	PE	5280
			**	8.06 (V)	PE	4134
	$C_4H_7N_2(CH_3)_3$ (Pyridazine, hexahydro-1,2,3-trimethyl-)	38704-92-6	**	7.81 (V)	PE	3887
			**	7.83	PE	5280
			**	7.83 (V)	PE	4134
			**	8.03 (V)	PE	4141
$C_7H_{18}N_2^+$	$(C_2H_5)_2NN(C_2H_5)(CH_3)$ (<i>n</i> - C_4H_9)(CH_3) $NN(CH_3)_2$	50599-43-4	**	8.02	PE	5280
		52598-10-4	**	8.12	PE	5280
			**	8.12 (V)	PE	4137
	$(tert-C_4H_9)(CH_3)NN(CH_3)_2$	60678-73-1	**	7.89	PE	5280
$C_8H_4N_2^+$	$C_6H_4(CN)_2$ (1,2-Benzenedicarbonitrile)	91-15-6	**	10.10 (V)	PE	4969
			**	10.27 (V)	PE	5259
	$C_6H_4(CN)_2$ (1,3-Benzenedicarbonitrile)	626-17-5	**	10.20 (V)	PE	5259
			**	10.60 (V)	PE	4969
	$C_6H_4(CN)_2$ (1,4-Benzenedicarbonitrile)	623-26-7	**	10.1 (V)	PE	5259
			**	10.10 (V)	PE	4969

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_8H_6N_2^+$	$C_8H_6N_2$ (Cinnoline)	253-66-7	**	<8.8	PE	3638
			**	8.90 (V)	PE	3722
	$C_8H_6N_2$ (1,5-Naphthyridine)	254-79-5	**	9.20 (V)	PE	3722
	$C_8H_6N_2$ (1,6-Naphthyridine)	253-72-5	**	9.07 (V)	PE	3722
	$C_8H_6N_2$ (1,7-Naphthyridine)	253-69-0	**	8.99 (V)	PE	3722
	$C_8H_6N_2$ (1,8-Naphthyridine)	254-60-4	**	9.20 (V)	PE	3722
	$C_8H_6N_2$ (2,6-Naphthyridine)	253-50-9	**	8.87 (V)	PE	3722
	$C_8H_6N_2$ (2,7-Naphthyridine)	253-45-2	**	8.98 (V)	PE	3722
	$C_8H_6N_2$ (Phthalazine)	253-52-1	**	8.70 (V)	PE	3722
	$C_8H_6N_2$ (Quinazoline)	253-82-7	**	9.00	PE	3638
			**	9.08 (V)	PE	3722
	$C_8H_6N_2$ (Quinoxaline)	91-19-0	**	9.00 (V)	PE	3722
			**	9.01	PE	3638
$C_8H_8N_2^+$	$(C_4H_4N)_2$ (1,1'-Bi-1H-pyrrole)	38602-81-2	**	8.30 (V)	PE	5387
	$C_8H_8N_2$ (9,10-Diazapentacyclo[4.4.0.0 ^{2,5} .0 ^{3,8} .0 ^{4,7}]dec-9-ene)	24046-80-8	**	7.68±0.05	PE	4449
$C_8H_{12}N_2^+$	$C_7H_{12}NCN$ (1-Azabicyclo[2.2.2]octane-4-carbonitrile)	26458-78-6	**	8.71±0.015 (V)	PE	4286
	$C_6H_4(NH_2)N(CH_3)_2$ (1,4-Benzenediamine, <i>N,N</i> -dimethyl-)	99-98-9	**	6.46	PI	4328
	$C_8H_{12}N_2$ (7,8-Diazatricyclo[4.2.2.0 ^{2,5}]dec-7-ene, (1 α ,2 β ,5 β ,6 α)-)	25863-08-5	**	7.68±0.05	PE	4449
	$C_4N_2(CH_3)_4$ (Pyrazine, tetramethyl-)	1124-11-4	**	8.6 (V)	PE	4161
$C_8H_{14}N_2^+$	$C_6H_8N_2(CH_3)_2$ (2,3-Diazabicyclo[2.2.2]oct-2-ene, 1,4-dimethyl-)	49570-30-1	**	8.06 (V)	PE	4429
	$C_6H_8N_2(CH_3)_2$ (2,3-Diazabicyclo[2.2.2]oct-5-ene, 2,3-dimethyl-)	14287-91-3	**	7.49 (V)	PE	4134
			**	7.51 (V)	PE	4277
			**	7.51 (V)	PE	5353
			**	7.59 (V)	PE	3889
	$C_8H_{14}N_2$ (7,8-Diazabicyclo[4.2.2]dec-7-ene)	32634-64-3	**	7.38±0.04	PE	3828
	$C_8H_{14}N_2$ (1,3-Diazatricyclo[3.3.1.1 ^{3,7}]decane)	281-29-8	**	7.75 (V)	PE	4659
$C_8H_{16}N_2^+$	$C_5H_{10}N_2C_3H_6$ (2H-Azirin-3-amine, <i>N,N</i> -diethyl-2,2-dimethyl-)	28942-55-4	**	7.68 (V)	PE	4780
	$(C_4H_8N)_2$ (1,1'-Bipyrrolidine)	18389-95-2	**	7.888 (V)	PE	4156
			**	7.91	PE	5280
			**	9.95 (V)	PE	5381
	$C_6H_{10}N_2(CH_3)_2$ (2,3-Diazabicyclo[2.2.2]octane, 2,3-dimethyl-)	14287-92-4	**	7.45 (V)	PE	4277

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_8H_{16}N_2^+$	$C_6H_{10}N_2(CH_3)_2$	14287-92-4	**	7.45 (V)	PE	5353
			**	7.46	PE	5280
	$C_6H_{10}N_2(CH_3)_2$ (2,3-Diazabicyclo[2.2.2]octane, 2,3-dimethyl-, <i>trans</i> -)	53779-85-4	**	7.46 (V)	PE	4134
	$C_8H_{16}N_2$ (1 <i>H</i> ,5 <i>H</i> -Pyrazolo[1,2- <i>a</i>][1,2]diazepine, hexahydro-)	49840-69-9	**	7.58 (V)	PE	4134
			**	7.58	PE	5280
	$C_4H_8N_2(CH_3)_4$ (Pyridazine, 1,2,3,6-tetrahydro-1,2,4,5-tetramethyl-)	14003-02-2	**	7.92 (V)	PE	4134
	$C_4H_8N_2(CH_3)_4$ (Pyridazine, 3,4,5,6-tetrahydro-3,3,6,6-tetramethyl-)	19403-24-8	**	7.89 (V)	PE	4429
	$C_8H_{16}N_2$ (Pyridazino[1,2- <i>a</i>]pyridazine, octahydro-)	3661-15-2	**	7.59 (V)	PE	3889
			**	7.60 (V)	PE	4134
			**	7.61	PE	5280
$C_8H_{18}N_2^+$	<i>trans</i> -(<i>tert</i> - C_4H_9N) $_2$	927-83-3	**	8.2±0.2 (V)	PE	4581
			**	8.20 (V)	PE	4429
	(<i>iso</i> - C_4H_9N) $_2$	3896-19-3	**	8.20 (V)	PE	4429
	$C_6H_{12}NN(CH_3)_2$ (1 <i>H</i> -Azepin-1-amine, hexahydro- <i>N,N</i> -dimethyl-)	60678-76-4	**	8.09	PE	5280
	$C_2H_4N_2(C_3H_7)_2$ (1,2-Diazetidene, 1,2-bis(1-methylethyl)- <i>trans</i>)	67092-87-9	**	7.6 (V)	PE	4780
	$C_4H_8N_2(C_2H_5)_2$ (Pyridazine, 1,2-diethylhexahydro-)	60678-82-2	**	7.81	PE	5280
	$C_4H_6(CH_3)_2N_2(CH_3)_2$ (Pyridazine, hexahydro-1,2,3,6-tetramethyl, <i>cis</i> -)	26171-64-2	**	7.76	PE	5280
			**	7.76 (V)	PE	4134
			**	7.82 (V)	PE	3887
	$C_4H_6(CH_3)_2N_2(CH_3)_2$ (Pyridazine, hexahydro-1,2,3,6-tetramethyl, <i>trans</i> -)	38704-91-5	**	7.55	PE	5280
			**	7.78 (V)	PE	3887
			**	7.82 (V)	PE	4134
$C_8H_{20}N_2^+$	($NH(C_4H_9)$) $_2$	1744-71-4	**	8.65 (V)	PE	5381
	($(C_2H_5)_2N$) $_2$	4267-00-9	**	7.94	PE	5280
			**	7.94 (V)	PE	4137
			**	7.94 (V)	PE	5381
			**	8.10 (V)	PE	3889
	(<i>n</i> - C_4H_9) $_2NNH_2$	7422-80-2	**	7.75±0.05	PE	4521
	(<i>n</i> - C_3H_7) $_2NN(CH_3)_2$	60678-72-0	**	7.98	PE	5280
	($NH(iso-C_4H_9)$) $_2$	3711-37-3	**	8.70 (V)	PE	5381
	(<i>iso</i> - C_4H_9) $_2NNH_2$	16596-38-6	**	7.73±0.05	PE	4521
	(<i>iso</i> - C_3H_7) $_2NN(CH_3)_2$	60678-66-2	**	7.65	PE	5280
	(<i>iso</i> - C_3H_7)(CH_3N) $_2$	60678-71-9	**	7.92	PE	5280
$C_9H_6N_2^+$	$C_9H_6N_2$ (Pyrazino[2,1,6- <i>cd</i>]pyrrolizine)	27884-36-2	**	7.65 (V)	PE	4812
$C_9H_{11}N_2^+$	$C_6H_5N=CHN(CH_3)_2$ (Methanimidamide, <i>N,N</i> -dimethyl- <i>N'</i> -phenyl-)	1783-25-1	H	9.0±0.1	EI	4359
			H	9.0	EI	4337
	$C_6H_4(F)N=CHN(CH_3)_2$ (Methanimidamide, <i>N'</i> -(2-fluorophenyl)- <i>N,N</i> -dimethyl-)	53666-09-4	F	8.9	EI	4337
	$C_6H_4(Cl)N=CHN(CH_3)_2$ (Methanimidamide, <i>N'</i> -(2-chlorophenyl)- <i>N,N</i> -dimethyl-)	2103-49-3	Cl	8.6±0.1	EI	4359
			Cl	8.6	EI	4337

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_9H_{11}N_2^+$	$C_6H_4(Br)N=CHN(CH_3)_2$ (Methanimidamide, N' -(2-bromophenyl)- N,N -dimethyl-)	53746-69-3	Br	8.4	EI	4337
	$C_6H_4(I)N=CHN(CH_3)_2$ (Methanimidamide, N' -(2-iodophenyl)- N,N -dimethyl-)	53666-10-7	I	8.4	EI	4337
$C_9H_{12}N_2^+$	$C_6H_5N=CHN(CH_3)_2$ (Methanimidamide, N,N -dimethyl- N' -phenyl-)	1783-25-1	**	7.3 ± 0.1	EI	4359
			**	7.3	EI	4337
$C_9H_{14}N_2^+$	$C_9H_{14}N_2$ (3,4-Diazatricyclo[4.2.1.0 ^{2,5}]non-7-ene, 3,4-dimethyl-(1 α ,2 β ,5 β ,6 α -))	67144-64-3	**	7.68 (V)	PE	4780
	$C_8H_{12}N_2(=CH_2)$ (1,3-Diazatricyclo[3.3.1.1 ^{3,7}]decane, 6-methylene-)	51500-09-5	**	7.53 (V)	PE	4659
$C_9H_{16}N_2^+$	$C_9H_{16}N_2$ (3,4-Diazatricyclo[4.2.1.0 ^{2,5}]nonane, 3,4-dimethyl-(1 α ,2 β ,5 β ,6 α -))	67144-63-2	**	7.64 (V)	PE	4780
	$C_9H_{16}N_2$ (1,4-Methanopyrazino[1,2- <i>a</i>]pyridazine, octahydro-)	72282-74-7	**	7.19 (V)	PE	5133
$C_9H_{18}N_2^+$	$C_5H_{10}N(C_4H_8N)$ (Piperidine, 1-(1-pyrrolidinyl)-)	49840-66-6	**	7.951 (V)	PE	4156
			**	7.95	PE	5280
$C_9H_{20}N_2^+$	$C_3H_6N_2(C_3H_7)_2$ (1-Azetidinamine, N,N -dipropyl-)	67092-89-1	**	7.5 (V)	PE	4780
	$C_3H_6N_2(C_3H_7)_2$ (Pyrazolidine, 1,2-bis(1-methylethyl)-)	38704-87-9	**	7.81 (V)	PE	4134
			**	7.89 (V)	PE	3889
			**	7.81	PE	5280
	$C_3H_4N_2(CH_3)_2(C_2H_5)_2$ (Pyrazolidine, 4,4-diethyl-1,2-dimethyl-, <i>trans</i> -)	53779-87-6	**	7.59 (V)	PE	4134
$C_{10}H_6N_2^+$	$C_{12}H_6N_4$ (2,3-Pyrazinedicarbonitrile, 5-phenyl-)	52109-66-7	(CN) ₂	13.20	EI	5488
$C_{10}H_8N_2^+$	$(C_5H_4N)_2$ (2,2'-Bipyridine)	366-18-7	**	8.35 ± 0.02	PE	3702
	$(C_5H_4N)_2$ (4,4'-Bipyridine)	553-26-4	**	9.10 ± 0.02	PE	3702
$C_{10}H_{10}N_2^+$	$C_{10}H_6(NH_2)_2$ (1,5-Naphthalenediamine)	2243-62-1	**	6.74 ± 0.02	PE	4143
	$C_{10}H_6(NH_2)_2$ (1,8-Naphthalenediamine)	479-27-6		6.65 ± 0.02	PE	4143
$C_{10}H_{12}N_2^+$	$C_4H_4NNC_4H_2(CH_3)_2$ (1,1'-Bi-1H-pyrrole, 2,5-dimethyl)	24046-14-8	**	7.77 (V)	PE	5387
	$C_6H_5CH_2C_3H_5N_2$ (1H-Imidazole, 4,5-dihydro-2-(phenylmethyl)-)	59-98-3	**	8.50 (V)	PE	5096
	$C_8H_6NCH_2CH_2NH_2$ (1H-Indole-3-ethanamine)	61-54-1	**	7.69 ± 0.08 (V)	PE	4672

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{10}H_{13}N_2^+$	$C_6H_3(Cl)(CH_3)N=CHN(CH_3)_2$ (Methanimidamide, <i>N'</i> (2-chloro-4-methylphenyl)- <i>N,N</i> -dimethyl-)	53666-35-6	Cl	8.6 ± 0.1	EI	4359
	$C_6H_3(Cl)(CH_3)N=CHN(CH_3)_2$ (Methanimidamide, <i>N'</i> (2-chloro-5-methylphenyl)- <i>N,N</i> -dimethyl-)	53666-41-4	Cl	8.5 ± 0.1	EI	4359
$C_{10}H_{14}N_2^+$	$C_6H_5N=N(tert-C_4H_9)$ (Diazene, (1,1-dimethylethyl)phenyl-)	1775-83-3	**	8.35 ± 0.2 (V)	PE	4581
	$C_6(NH_2)_2(CH_3)_4$ (1,4-Benzenediamine, 2,3,5,6-tetramethyl-)	3102-87-2	**	8.63 ± 0.03	PI	5552
$C_{10}H_{16}N_2^+$	$C_6H_4(N(CH_3)_2)_2$ (1,4-Benzenediamine, <i>N,N,N',N'</i> -tetramethyl-)	100-22-1	**	6.1 ± 0.1	PE	4401
			**	6.20 ± 0.05	PI	3729
			**	6.7	CTS	3543
			**	6.75 (V)	PE	5382
	$C_6(NH_2)_2(CH_3)_4$ (1,4-Benzenediamine, 2,3,5,6-tetramethyl-)	3102-87-2	**	6.43	PI	4328
	$C_{10}H_{16}N_2$ (1,4-Ethanopyridazino[1,2- <i>a</i>]pyridazine, 1,4,6,7,8,9-hexahydro-)	72282-73-6	**	7.07 (V)	PE	5133
$C_{10}H_{18}N_2^+$	$C_6H_6N_2(CH_3)_4$ (2,3-Diazabicyclo[2.2.2]oct-5-ene, 1,2,3,4-tetramethyl-)	53779-88-7	**	7.43 (V)	PE	4134
	$C_{10}H_{18}N_2$ (1,4-Ethanopyridazino[1,2- <i>a</i>]pyridazine, octahydro-)	72282-72-5	**	7.06 (V)	PE	5133
	$C_3N_2(CH_3)_4(=C(CH_3)_2)$ (3H-Pyrazole, 4,5-dihydro-3,3,5,5-tetramethyl-4-(1-methylethylidene)-)	55204-47-2	**	8.58 (V)	PE	4429
$C_{10}H_{20}N_2^+$	$C_5H_8N_2(tert-C_4H_9)(CH_3)$ (2,3-Diazabicyclo[2.2.1]heptane, 2-(1,1-dimethylethyl)-3-methyl-)	42842-99-9	**	7.34	PE	5280
			**	7.33 (V)	PE	4134
	$C_6H_{14}N_2(CH_3)_2$ (9-Azabicyclo[3.3.1]nonan-9-amine, <i>N,N</i> -dimethyl-)	60678-79-7	**	7.53 (V)	PE	5091
	$C_6H_{12}NNC_4H_8$ (1H-Azepine, hexahydro-1-(pyrrolidinyl)-)	60678-75-3	**	7.60	PE	5280
	$(C_5H_{10}N)_2$ (1,1'-Bipiperidine)	6130-94-5	**	7.89	PE	5280
			**	7.892 (V)	PE	4156
			**	8.05 (V)	PE	4085
	$C_6H_8(CH_3)_2N_2(CH_3)_2$ (2,3-Diazabicyclo[2.2.2]octane, 1,2,3,4-tetramethyl-)	59498-94-1	**	7.43	PE	5280
	$C_6H_8N_2(CH_3)_4$ (2,3-Diazabicyclo[2.2.2]octane, 1,2,3,4-tetramethyl-, <i>trans</i> -)	53779-86-5	**	7.43 (V)	PE	4134
	$(C_3H_4(CH_3)_2)_2N_2$ (1H,5H-Pyrazolo[1,2- <i>a</i>]pyrazole, tetrahydro-2,2,6,6-tetramethyl-)	2940-98-9	**	7.53	PE	5280
			**	7.53 (V)	PE	4134
$C_{10}H_{22}N_2^+$	$C_4H_4(CH_3)_4N_2(CH_3)_2$ (Pyridazine, hexahydro-1,2,3,3,6,6-hexamethyl-)	60678-80-0	**	7.46	PE	5280
$C_{10}H_{24}N_2^+$	$(iso-C_3H_7)_2NN(iso-C_3H_7)(CH_3)$	XXXXXX-XX-X	**	7.60	PE	5280
	$(n-C_3H_7)_2NN(C_2H_5)_2$	52598-09-1	**	7.87	PE	5280
			**	7.87 (V)	PE	4137
	$(n-C_4H_9)_2NN(CH_3)_2$	60678-67-3	**	7.96	PE	5280
	$(iso-C_3H_7)_2NN(C_2H_5)_2$	XXXXXX-XX-X	**	8.126 (V)	PE	4156

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{10}H_{24}N_2^+$	-					
	<i>iso</i> -C ₃ H ₇ N(CH ₃)N(<i>iso</i> -C ₃ H ₇) ₂	49840-64-4	**	7.59 (V)	PE	
			**	7.895 (V)	PE	4156
	<i>((tert</i> -C ₄ H ₉)(CH ₃)N) ₂	52291-46-0	**	7.67	PE	5280
			**	7.67 (V)	PE	4137
			**	7.67 (V)	PE	5381
			**	7.920 (V)	PE	4156
$C_{11}H_8N_2^+$	C ₁₁ H ₈ N ₂ (1 <i>H</i> -Perimidine)	204-02-4	**	6.80	CTS	4035
	C ₁₁ H ₈ N ₂ (9 <i>H</i> -Pyrido[3,4- <i>b</i>]indole)	244-63-3	**	7.99±0.06 (V)	PE	4758
$C_{11}H_{14}N_2^+$	C ₆ H ₄ (CH ₃)CH ₂ C ₅ H ₅ N ₂ (1 <i>H</i> -Imidazole,4,5-dihydro-2-[(2-methylphenyl)methyl]-)	3038-50-4	**	8.60 (V)	PE	5096
	C ₈ H ₆ NCH ₂ CH ₂ NHCH ₃ (1 <i>H</i> -Indole-3-ethanamine, N-methyl-)	61-49-4	**	7.60±0.08 (V)	PE	4672
	C ₈ H ₅ N(CH ₃)CH ₂ CH ₂ NH ₂ (1 <i>H</i> -Indole-3-ethanamine, 5-methyl-)	1821-47-2	**	7.64±0.05 (V)	PE	4672
	C ₈ H ₆ NCH ₂ N(CH ₃) ₂ (1 <i>H</i> -Indole-3-methanamine, N,N-dimethyl-)	87-52-5	**	7.69±0.16 (V)	PE	4672
$C_{11}H_{22}N_2^+$	C ₁₁ H ₂₂ N ₂ (8-Azabicyclo[3.2.1]octan-3-amine,8-methyl-N-propyl- <i>endo</i> -)	67216-34-6	**	8.0±0.15	EI	5401
	C ₁₁ H ₂₂ N ₂ (8-Azabicyclo[3.2.1]octan-3-amine,8-methyl-N-propyl- <i>exo</i> -)	67139-56-4	**	8.1±0.15	EI	5401
	C ₆ H ₁₂ NNC ₅ H ₁₀ (1 <i>H</i> -Azepine,hexahydro-1-(1-piperidinyl)-)	60778-60-1	**	7.87	PE	5280
$C_{12}H_8N_2^+$	C ₁₂ H ₈ N ₂ (Benzo[<i>c</i>]cinnoline)	230-17-1	**	~8.69±0.02 (V)	PE	4430
	C ₁₂ H ₈ N ₂ (1,10-Phenanthroline)	66-71-7	**	8.51±0.02 (V)	PE	4430
	C ₁₂ H ₈ N ₂ (4,7-Phenanthroline)	230-07-9	**	8.35±0.02 (V)	PE	4430
	C ₁₂ H ₈ N ₂ (Phenazine)	92-82-0	**	8.33±0.02 (V)	PE	4430
			**	8.44±0.02 (V)	PE	4551
$C_{12}H_{10}N_2^+$	C ₆ H ₅ N=NC ₆ H ₅ (Diazene, diphenyl-)	103-33-3	**	8.5 (V)	PE	4467
	<i>trans</i> -C ₆ H ₅ N=NC ₆ H ₅ (Diazene, diphenyl-, <i>trans</i> -)	17082-12-1	**	8.46 (V)	PE	4475
	<i>trans</i> -(C ₅ H ₄ N) ₂ CH=CH (Pyridine, 2,2'-(1,2-ethenediyl)bis-(E)-)	13341-40-7	**	8.5±0.05 (V)	PE	5320
	<i>trans</i> -(C ₅ H ₄ N) ₂ CH=CH (Pyridine, 4,4'-(1,2-ethenediyl)bis-(E)-)	13362-78-2	**	8.18±0.03 (V)	PE	4805
	<i>trans</i> -(C ₅ H ₄ N) ₂ CH=CH (Pyridine, 2-[2-(3-pyridinyl)ethenyl]-(E)-)	13362-75-9	**	8.83±0.03 (V)	PE	4805
	<i>trans</i> -(C ₅ H ₄ N) ₂ CH=CH (Pyridine, 2-[2-(4-pyridinyl)ethenyl]-(E)-)	14802-41-6	**	8.33±0.03 (V)	PE	4805
	<i>trans</i> -(C ₅ H ₄ N) ₂ CH=CH (Pyridine, 2-[2-(4-pyridinyl)ethenyl]-(E)-)	486-84-0	**	8.50±0.03 (V)	PE	4805
	C ₁₁ H ₇ N ₂ CH ₃ (9 <i>H</i> -Pyrido[3,4- <i>b</i>]indole, 1-methyl-)	486-84-0	**	7.83±0.06 (V)	PE	4758
	C ₆ H ₄ (NH ₂)C ₆ H ₄ NH ₂ ([1,1'-Biphenyl]-4,4'-diamine)	92-87-5	**	6.88	PI	4328

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{12}H_{12}N_2^+$	$(C_6H_5NH)_2$ (Hydrazine, 1,2-diphenyl-)	122-66-7	**	7.78 ± 0.05	PE	5322
			**	7.78 (V)	PE	5381
$C_{12}H_{14}N_2^+$	$(C_4H_2NHCH_2CH_2)_2$ (13,14-Diazatricyclo[8.2.1.1 ^{4,7}]tetradeca-4,6,10,12-tetraene)	73650-67-6	**	7.45 (V)	PE	5575
$C_{12}H_{16}N_2^+$	$(C_4H_2N(CH_3)_2)_2$ (1,1'-Bi-1H-pyrrole, 2,2',5,5'-tetramethyl-)	10507-71-8	**	7.73 (V)	PE	5387
	$C_{12}H_{16}N_2$ (Benzenecarboximidamide, N,N-dimethyl-N'-1-propenyl)	68003-59-8	**	7.20 (V)	PE	4968
	$C_8H_6NCH_2CH_2N(CH_3)_2$ (1H-Indole-3-ethanamine, N,N-dimethyl-)	61-50-7	**	7.57 ± 0.05 (V)	PE	4672
$C_{12}H_{20}N_2^+$	$C_6H_{10}NN(C_6H_{10})$ (Cyclohexanone, cyclohexylidenehydrazone)	4278-87-9	**	7.84	PE	4043
	$(C_6H_{10}N)_2$	XXXXX-XX-X	**	7.84	PE	5589
$C_{12}H_{22}N_2^+$	$C_8H_{14}N_2C_4H_8$ (Pyridazino[1,2- <i>b</i>]phthalazine, dodecahydro-, <i>trans</i> -)	60678-83-3	**	7.51	PE	5280
$C_{12}H_{25}N_2^+$	$C_{12}H_{25}N_2^+$ (Hexyl, 1,1,5-trimethyl-5-[(1-methylethyl)azo]-)	73322-99-3	**	7.39 (V)	PE	5091
$C_{12}H_{28}N_2^+$	$(n-C_4H_9)_2NN(C_2H_5)_2$	60678-68-4	**	7.77	PE	5280
	$((n-C_3H_7)_2N)_2$	60678-69-5	**	7.74	PE	5280
$C_{13}H_8N_2^+$	$C_{11}H_8(CN)_2$ (1,4-Methanonaphthalene-2,5-dicarbonitrile, 1,4-dihydro-)	71925-32-1	**	9.31 ± 0.05 (V)	PE	5235
	$C_{11}H_8(CN)_2$ (1,4-Methanonaphthalene-2,6-dicarbonitrile, 1,4-dihydro-)	71925-30-9	**	9.30 ± 0.05 (V)	PE	5235
	$C_{11}H_8(CN)_2$ (1,4-Methanonaphthalene-2,7-dicarbonitrile, 1,4-dihydro-)	71925-31-0	**	9.27 ± 0.05 (V)	PE	5235
	$C_{11}H_8(CN)_2$ (1,4-Methanonaphthalene-2,8-dicarbonitrile, 1,4-dihydro-)	71925-33-2	**	9.27 ± 0.05 (V)	PE	5235
$C_{13}H_{10}N_2^+$	$C_{13}H_{10}N_2$ (1H-Phenalen-9-amine, 1-iminio-)	67618-27-3	**	7.27 ± 0.1 (V)	PE	4951
$C_{13}H_{12}N_2^+$	$C_6H_5NNC_6H_4CH_3$ (Diazene, (4-methylphenyl)phenyl-(E)-)	6720-39-4	**	~ 8.3 (V)	PE	5320
$C_{13}H_{14}N_2^+$	$(C_6H_4NH_2)_2CH_2$ (Benzenamine, 4-4'-methylenebis-)	101-77-9	**	7.20	PI	4328
			**	7.75 ± 0.05	EI	3806
$C_{13}H_{16}N_2^+$	$C_{10}H_{11}C_3H_5N_2$ (1H-Imidazole, 4,5-dihydro-2-(1,2,3,4,-tetrahydro-1-naphthalenyl)-)	84-22-0	**	8.33 (V)	PE	5096

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{13}H_{22}N_2^+$	$C_{13}H_{22}N_2$ (5,8-Ethano-1H-pyrazolo[1,2- <i>a</i>]pyridazine,2,2-diethyl-2,3,5,8-tetrahydro-)	72282-76-9	**	7.04 (V)	PE	5133
	$C_{13}H_{22}N_2$ (Spiro[cyclohexane-1,3'-[3 <i>H</i> -2,6]methanoimidazo[1,5- <i>a</i>]pyridine])	53994-42-6	**	7.46 (V)	PE	4141
$C_{13}H_{24}N_2^+$	$C_6H_{10}N_2C_3H_4(C_2H_5)_2$ (5,8-Ethano-1H-pyrazolo[1,2- <i>a</i>]pyridazine,2,2-diethylhexahydro-)	23211-28-1	**	6.92	PE	5280
			**	6.93 (V)	PE	4134
$C_{14}H_{12}N_2^+$	$C_{13}H_9N_2(CH_3)$ (1 <i>H</i> -Cyclopenta[<i>gk</i>]perimidine, 6,7-dihydro-1-methyl-)	18969-93-2	**	6.53	CTS	4035
$C_{14}H_{14}N_2^+$	$(C_5H_3N)_2(CH_2)_4$ (15,16-Diazatricyclo[9.3.1.1 ^{4,8}] hexadeca-1(15),4,6,8(16),11,13-hexaene)	6574-83-0	**	8.35	PE	4386
	$C_{14}H_{14}N_2$ (1,4-Ethanonaphtho[1,8- <i>ef</i>]-1,4-diazepine, 2,3-dihydro-)	59950-41-3	**	7.56 (V)	PE	4419
	$C_{10}H_7CH_2C_3H_5N_2$ (1H-Imidazole,4,5-dihydro-2-(1-naphthalenylmethyl)-)	835-31-4	**	8.46 (V)	PE	5096
$C_{14}H_{16}N_2^+$	$C_6H_4(NH_2)CH_2CH_2C_6H_4NH_2$ (Benzenamine, 4,4'-(1,2-ethanediy)bis-)	621-95-4	**	7.45±0.05	EI	3806
	$(C_4H_2N)_2(C_3H_6)_2$ (10b,10c-Diazadicyclopenta[<i>ef,kl</i>]heptalene,3,4,5,8,9,10-hexahydro-)	56751-92-9	**	7.72 (V)	PE	5387
	$(C_6H_5N(CH_3))_2$ (Hydrazine,1,2-dimethyl-1,2-diphenyl-)	14996-70-4	**	7.30±0.05	PE	5322
$C_{14}H_{18}N_2^+$	$C_{10}H_6(N(CH_3)_2)_2$ (1,5-Naphthalenediamine, <i>N,N,N',N'</i> -tetramethyl-)	10075-69-1	**	6.70±0.02	PE	4143
	$C_{10}H_6(N(CH_3)_2)_2$ (1,8-Naphthalenediamine, <i>N,N,N',N'</i> -tetramethyl-)	20734-58-1	**	6.45±0.02	PE	4143
	$C_{14}H_{18}N_2$ (1,4-Ethanopyridazino[1,2- <i>b</i>]phthalazine,1,2,3,4,6,11-hexahydro-)	72282-75-8	**	7.21 (V)	PE	5133
$C_{15}H_{14}N_2^+$	$C_{13}H_7(=NCH_3)NHCH_3$ (Phenylene,9-methylamino-1-methylimino-)	XXXXX-XX-X	**	6.98±0.04 (V)	PE	5595
$C_{15}H_{16}N_2^+$	$C_3H_6N_2(C_6H_5)_2$ (Pyrazolidine,1,2-diphenyl-)	63378-86-9	**	7.50±0.05	PE	5322
$C_{16}H_8N_2^+$	$C_{18}H_8N_4$ (Dibenzo[<i>f,h</i>]quinoxaline-2,3-dicarbonitrile)	55408-49-6	(CN) ₂	12.30	EI	5488
$C_{16}H_{18}N_2^+$	$C_{16}H_{18}N_2$ (2H-1,5-Propano-1H-naphtho[1,8- <i>bc</i>]-1,5-diazocine,3,4-dihydro-)	59950-40-2	**	6.90 (V)	PE	4419
	$C_4H_8N_2(C_6H_5)_2$ (Pyridazine,hexahydro-1,2-diphenyl-)	63378-87-0	**	7.30±0.05	PE	5322
$C_{16}H_{20}N_2^+$	$C_6H_4(N(CH_3)_2)C_6H_4N(CH_3)_2$ ([1,1'-Biphenyl]-4,4'-diamine, <i>N,N,N',N'</i> -tetramethyl-)	366-29-0	**	6.40	PI	4328
$C_{16}H_{24}N_2^+$	$C_{16}H_{24}N_2$ (1H-Imidazole,2-[[4-(1,1-dimethylethyl)-2,6-dimethylphenyl]methyl]-4,5-dihydro-)	526-36-3	**	8.49 (V)	PE	5096

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{16}H_{28}N_2^+$	$(C_8H_{14}N)_2$ (9,9'-Bi-9-azabicyclo[3.3.1]nonane)	62796-83-2	**	6.94 (V)	PE	5091
$C_{16}H_{34}N_2^+$	<i>trans</i> - $((CH_3)_3CCH_2C(CH_3)_2)_2N=N$	55204-43-8	**	8.00 (V)	PE	
$C_{17}H_{20}N_2^+$	$C_5H_{10}N_2(C_6H_5)_2$ (1 <i>H</i> -1,2-Diazepine, hexahydro-1,2-diphenyl-)	63378-89-2	**	7.30 ± 0.05	PE	5322
$C_{17}H_{22}N_2^+$	$(C_6H_4N(CH_3)_2)_2CH_2$ (Benzenamine, 4,4'-methylenebis(<i>N,N</i> -dimethyl)-)	101-61-1	**	6.72	PI	4328
			**	7.1	CTS	3543
$C_{18}H_{18}N_2^+$	$C_6H_5C_3H_3(CN)C_6H_4N(CH_3)_2$ (Cyclopropanecarbonitrile, 2-(<i>p</i> -(dimethylamino)phenyl)-1-phenyl-)	6114-58-5	**	6.90 ± 0.10	EI	3575
$C_{18}H_{20}N_2^+$	$C_6H_{10}N_2(C_6H_5)_2$ (2,3-Diazabicyclo[2.2.2]octane, 2,3-diphenyl-)	63378-90-5	**	7.15 ± 0.05	PE	5322
$C_{18}H_{24}N_2^+$	$(C_6H_5N(iso-C_3H_7))_2$ (Hydrazine, 1,2-bis(1-methylethyl)-1,2-diphenyl-)	63378-85-8	**	7.20 ± 0.05	PE	5322
		63378-84-7	**	7.24 ± 0.05	PE	5322
$C_{19}H_{26}N_2^+$	$C_6H_4(CH_3)C_3H_3(CN)C_6H_4N(CH_3)_2$ (Cyclopropanecarbonitrile, 2-(<i>p</i> -(dimethylamino)phenyl)-1- <i>p</i> -tolyl-)	32589-51-8	**	6.80 ± 0.07	EI	3575
$C_{19}H_{24}N_2^+$	$C_{14}H_{12}N(CH_2)_3N(CH_3)_2$ (5 <i>H</i> -Dibenz[<i>b,f</i>]azepine-5-propanamine, 10,11-dihydro- <i>N,N</i> -dimethyl-)	50-49-7	**	8.21 ± 0.07	CTS	4079
$C_{20}H_{18}N_2^+$	$C_6H_4(CH_2NC_6H_5)_2$ (Phthalazine, 1,2,3,4-tetrahydro-2,3-diphenyl-)	16460-56-3	**	7.32 ± 0.05	PE	5322
$C_{20}H_{22}N_2^+$	$C_8H_{12}N_2(C_6H_5)_2$ (1,3-Diazatricyclo[3.3.1.1 ^{3,7}]decane, 5,7-diphenyl-)	38705-08-7	**	7.54 ± 0.03 (V)	PE	4163
$C_{20}H_{24}N_2^+$	$C_6H_{10}(CH_2NC_6H_5)_2$ (Phthalazine, decahydro-2,3-diphenyl, <i>trans</i> -)	63378-88-1	**	7.01 ± 0.05	PE	5322
$C_{20}H_{34}N_2^+$	$C_4(CH_3)_4(=NC_6H_{11})_2$ (Cyclohexanamine, <i>N,N'</i> -(2,2,4,4-tetramethyl-1,3-cyclobutanediylidene)bis-)	6119-44-4	**	8.33 (V)	PE	5499
$C_{24}H_{16}N_2^+$	$C_{24}H_{16}N_2$ (25,26-Diazapentacyclo[19.3.1.1 ^{9,13} .0 ^{4,16} .0 ^{6,18}]hexacos-1(25), 2,4,6(18),7,9,11,13(26),14,16,19,21,23-tridecaene)	64031-65-8	**	6.97 (V)	PE	4824
$C_{26}H_{24}N_2^+$	$(C_6H_5N(CH_2C_6H_5))_2$ (Hydrazine, 1,2-diphenyl-1,2-bis(phenylmethyl)-)	29334-75-6	**	7.59 ± 0.05	PE	5322

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
CH₃N₃⁺	CH ₃ N ₃	624-90-8	**	9.81 ± 0.02	PE	3670
C₂H₃N₃⁺	C ₂ H ₃ N ₃ (1 <i>H</i> -1,2,4-Triazole)	288-88-0	**	10.6 (V)	PE	5228
	C ₂ H ₃ N ₃ (1 <i>H</i> -1,2,3-Triazole)	288-36-8	**	10.0 (V)	PE	4009
	C ₂ H ₃ N ₃ (1 <i>H</i> -1,2,4-Triazole)	288-88-0	**	10.06 (V)	PE	4009
C₃H₃N₃⁺	C ₃ H ₃ N ₃ (1,2,4-Triazine)	290-38-0	**	9.61 (V)	PE	4707
	C ₃ H ₃ N ₃ (1,3,5-Triazine)	290-87-9	**	9.98	PE	3679
			**	10.01 ± 0.01	PE	3720
			**	10.1	PE	3637
C₄H₅N₃⁺	C ₃ H ₂ N ₃ (CH ₃) (1,2,4-Triazine, 3-methyl-)	24108-33-6	**	9.26 (V)	PE	4707
	C ₃ H ₂ N ₃ (CH ₃) (1,2,4-Triazine, 5-methyl-)	21134-95-2	**	9.31 (V)	PE	4707
	C ₃ H ₂ N ₃ (CH ₃) (1,2,4-Triazine, 6-methyl-)	21134-96-3	**	9.35 (V)	PE	4707
C₅HN₃⁺	C(CN) ₂ = CHCN	997-76-2	**	~11.55	PE	4859
	C ₁₂ H ₆ N ₄ (2,3-Pyrazinedicarbonitrile, 5-phenyl-)	52109-66-7	C ₆ H ₅ CN	11.27	EI	5488
C₅H₇N₃⁺	C ₃ HN ₃ (CH ₃) ₂ (1,2,4-Triazine, 3,5-dimethyl-)	24108-34-7	**	9.02 (V)	PE	4707
	C ₃ HN ₃ (CH ₃) ₂ (1,2,4-Triazine, 5,6-dimethyl-)	21134-90-7	**	9.15 (V)	PE	4707
C₆H₃N₃⁺	C ₁₃ H ₈ N ₄ (2,3-Pyrazinedicarbonitrile, 5-methyl-6-phenyl-)	52109-67-8	C ₆ H ₅ CN	11.92	EI	5488
C₆H₅N₃⁺	C ₆ H ₅ N ₃ (Benzene, azido-)	622-37-7	**	8.72 ± 0.02 (V)	PE	4674
	C ₆ H ₅ N ₃ (1 <i>H</i> -Benzotriazole)	95-14-7	**	9.20 ± 0.05	EI	4316
	C ₄ H ₃ N ₂ C ₂ H ₂ N (Imidazo[1,2- <i>b</i>]pyridazine)	766-55-2	**	8.33 (V)	PE	5396
C₆H₉N₃⁺	C ₃ N ₃ (CH ₃) ₃ (1,2,4-Triazine, 3,5,6-trimethyl-)	24108-36-9	**	8.84 (V)	PE	4707
C₆H₁₅N₃⁺	(CH ₂ = NCH ₃) ₃	108-74-7	**	8.33 ± 0.05 (V)	PE	4776
	(CH ₃ CH = NH) ₃	638-14-2	**	8.45 ± 0.05 (V)	PE	4776
	C ₃ H ₆ N ₃ (CH ₃) ₃ (1,2,4-Triazine, hexahydro-1,2,4-trimethyl-)	66175-25-5	**	8.10 (V)	PE	5215

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_8H_{15}N_3^+$	$C_7H_{12}N_3(CH_3)$ (1,3,5-Triazatricyclo[3.3.1.1. ^{3,7}]decane, 7-methyl-)	38705-10-1	**	8.08 (V)	PE	4141
$C_9H_{11}N_3^+$	$C_6H_5NC_3H_4N_2H_2$ (Imidazolidine,2-(phenylimino)-)	XXXXXX-XX-X	**	7.85 (V)	PE	5545
$C_{10}H_{11}N_3^+$	$C_6H_4C_4H_7N_3$ (Imidazo[2,1- <i>b</i>]quinazoline,1,2,3,5-tetrahydro-)	32725-29-4	**	7.46 (V)	PE	5545
$C_{10}H_{13}N_3^+$	$C_6H_4(CH_3)NC_3H_4N_2H_2$ (Imidazolidine,2-(2-methylphenylimino)-)	XXXXXX-XX-X	**	7.75 (V)	PE	5545
$C_{11}H_5N_3^+$	$C_{12}H_6N_4$ (2,3-Pyrazinedicarbonitrile,5-phenyl-)	52109-66-7	HCN	11.61	EI	5488
	$C_{13}H_8N_4$ (2,3-Pyrazinedicarbonitrile,5-methyl-6-phenyl-)	52109-67-8	CH_3CN	11.48	EI	5488
$C_{11}H_{15}N_3^+$	$C_6H_3(CH_3)_2NC_3H_4N_2H_2$ (Imidazolidine,2-(2,6-dimethylphenylimino)-)	XXXXXX-XX-X	**	7.63 (V)	PE	5545
$C_{11}H_{16}N_3^+$	$C_6H_4(N(CH_3)_2)N=CHN(CH_3)_2$ (Methanimidamide, <i>N'</i> -[3-(dimethylamino)phenyl]- <i>N,N</i> -dimethyl-)	53666-32-3	H	8.8 ± 0.1	EI	4359
	$C_6H_4(N(CH_3)_2)N=CHN(CH_3)_2$ (Methanimidamide, <i>N'</i> -[4-(dimethylamino)phenyl]- <i>N,N</i> -dimethyl-)	53666-31-2	H	9.0 ± 0.1	EI	4359
	$C_6H_3(Cl)(N(CH_3)_2)N=CHN(CH_3)_2$ (Methanimidamide, <i>N'</i> -[2-chloro-4-(dimethylamino)phenyl]- <i>N,N</i> -dimethyl-)	53666-30-1	Cl	9.1 ± 0.1	EI	4359
	$C_6H_3(Cl)(N(CH_3)_2)N=CHN(CH_3)_2$ (Methanimidamide, <i>N'</i> -[2-chloro-5-(dimethylamino)phenyl]- <i>N,N</i> -dimethyl-)	53666-39-0	Cl	8.9 ± 0.1	EI	4359
$C_{11}H_{17}N_3^+$	$C_6H_4(N(CH_3)_2)N=CHN(CH_3)_2$ (Methanimidamide, <i>N'</i> -[3-(dimethylamino)phenyl]- <i>N,N</i> -dimethyl-)	53666-32-3	**	6.3 ± 0.1	EI	4359
	$C_6H_4(N(CH_3)_2)N=CHN(CH_3)_2$ (Methanimidamide, <i>N'</i> -[4-(dimethylamino)phenyl]- <i>N,N</i> -dimethyl-)	53666-31-2	**	6.1 ± 0.1	EI	4359
$C_{12}H_7N_3^+$	$C_{13}H_8N_4$ (2,3-Pyrazinedicarbonitrile,5-methyl-6-phenyl-)	52109-67-8	HCN	14.82	EI	5488
$C_{12}H_8N_3^+$	$C_{13}H_8N_4$ (2,3-Pyrazinedicarbonitrile,5-methyl-6-phenyl-)	52109-67-8	CN	15.10	EI	5488
$C_{12}H_9N_3^+$	$C_4H_3N_2C_2HNC_6H_5$ (Imidazo[1,2- <i>b</i>]pyridazine,2-phenyl-)	1844-54-8	**	7.73 (V)	PE	5396
$C_{12}H_{11}N_3^+$	$C_6H_5NNC_6H_4NH_2$ (Benzenamine,4-(phenylazo)-(E)-)	25548-34-9	**	7.67 ± 0.05 (V)	PE	5320
	$C_{11}H_6N_2(NH_2)CH_3$ (1 <i>H</i> -Perimindin-2-amine, 1-methyl-)	20551-10-4	**	6.41	CTS	4035
$C_{12}H_{13}N_3^+$	$(C_6H_4NH_2)_2NH$ (1,4-Benzenediamine, <i>N</i> -(4-aminophenyl)-)	537-65-5	**	6.20	PI	4328

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{13}H_{17}N_3^+$	$C_{10}H_{11}NC_3H_4N_2H_2$ (Imidazolidine,2-[(5,6,7,8-tetrahydronaphthal-1-yl)imino-])	XXXXXX-XX-X **		7.62 (V)	PE	5545
$C_{17}H_8N_3^+$	$C_{18}H_8N_4$ (Dibenzo[<i>f,h</i>]quinoxaline-2,3-dicarbonitrile)	55408-49-6	CN	13.10	EI	5488
$CH_2N_4^+$	CH_2N_4 (1 <i>H</i> -Tetrazole)	288-94-8	**	11.3 (V)	PE	4009
$C_2H_2N_4^+$	$C_2H_2N_4$ (1,2,4,5-Tetrazine)	290-96-0	**	9.14	PE	3679
			**	9.24	PE	3740
$C_2H_4N_4^+$	$C_2H_4N_4$ (1 <i>H</i> -1,2,4-Triazole-5-amine) $C_4H_6N_4$ (1 <i>H</i> -1,2,4-Triazol-5-amine,1-ethyl-) $C_4H_8N_4$ (4 <i>H</i> -1,2,4-Triazol-3-amine,4-ethyl-) $C_4H_8N_4$ (1 <i>H</i> -1,2,4-Triazole-3-amine,1-ethyl-) $C_5H_{10}N_4$ (4 <i>H</i> -1,2,4-Triazol-3-amine,4-propyl-) $C_5H_{10}N_4$ (1 <i>H</i> -1,2,4-Triazole-3-amine,1-propyl-) $C_5H_{10}N_4$ (1 <i>H</i> -1,2,4-Triazole-5-amine,1-propyl-)	XXXXXX-XX-X 58661-94-2 42786-06-1 42786-04-9 58661-97-5 58661-95-3 58661-96-4	C_2H_4 C_2H_4 C_2H_4 C_3H_6 C_3H_6	8.3 10.0 10.2 10.2 10.4 10.2 9.9	EI EI EI EI EI EI EI	5487 5487 5487 5487 5487 5487 5487
$C_4H_6N_4^+$	$C_2N_4(CH_3)_2$ (1,2,4,5-Tetrazine, 3,6-dimethyl-)	1558-23-2	**	9.08 (V)	PE	3679
$C_4H_8N_4^+$	$C_4H_8N_4$ (1 <i>H</i> -1,2,4-Triazol-5-amine,1-ethyl-) $C_4H_8N_4$ (4 <i>H</i> -1,2,4-Triazol-3-amine,4-ethyl-) $C_4H_8N_4$ (1 <i>H</i> -1,2,4-Triazole-3-amine,1-ethyl-)	58661-94-2 42786-06-1 42786-04-9		8.5 8.3 8.2	EI EI EI	5487 5487 5487
$C_4H_{10}N_4^+$	$C_2N_2(CH_3)_2=N_2$ (1,2,3,4-Tetrazine,1,4,5,6-tetrahydro-1,4-dimethyl-)	39247-66-0	**	8.03 (V)	PE	5604
$C_4H_{12}N_4^+$	$((CH_3)_2N_2)_2$ (2-Tetrazene,1,1,4,4-tetramethyl-)	6130-87-6	**	7.7 (V)	PE	5604
$C_5H_4N_4^+$	$C_5H_4N_4$ (1 <i>H</i> -Purine) $C_5H_4NN_3$ (Tetrazolo[1,5- <i>a</i>]Pyridine) $C_5H_4N_4$ (1 <i>H</i> -1,2,3-Triazolo[4,5- <i>c</i>]pyridine) $C_5H_4N_4$ ([1,2,4]Triazolo[1,5- <i>a</i>]pyrazine)	120-73-0 274-87-3 273-05-2 399-66-6	** ** ** **	9.52±0.03 (V) 8.85 (V) 9.10±0.05 9.6 (V)	PE PE EI PE	4445 5396 4316 5492

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_5H_4N_4^+$	$C_5H_4N_4$ (1H-1,2,3-Triazolo[4,5-b]pyridine)	273-34-7	**	9.20 ± 0.05	EI	4316
$C_5H_{10}N_4^+$	$C_5H_{10}N_4$ (4H-1,2,4-Triazol-3-amine,4-propyl-)	58661-97-5		8.3	EI	5487
$C_5H_{10}N_4^+$	$C_5H_{10}N_4$ (1H-1,2,4-Triazole-3-amine,1-propyl-)	58661-95-3		8.1	EI	5487
$C_5H_{10}N_4^+$	$C_5H_{10}N_4$ (1H-1,2,4-Triazole-5-amine,1-propyl-)	58661-96-4		8.3	EI	5487
$C_6H_6N_4^+$	$C_5H_3N_4CH_3$ (1H-Purine, 6-methyl-)	2004-03-7	**	9.3 (V)	PE	5492
$C_6H_6N_4^+$	$C_5H_3N_4CH_3$ (7H-Purine, 7-methyl-)	18346-04-8	**	9.4 (V)	PE	5492
$C_6H_6N_4^+$	$C_5H_3N_4CH_3$ (9H-Purine, 9-methyl-)	20427-22-9	**	9.4 (V)	PE	5492
$C_6H_{12}N_4^+$	$C_6H_{12}N_4$ (1,3,5,7-Tetraazatricyclo[3.3.1.1.3.7]decane)	100-97-0	**	8.53 (V)	PE	4141
$C_6H_{16}N_4^+$	$C_2H_4N_4(CH_3)_4$ (1,2,4,5-Tetrazacyclohexane, 1,2,4,5-tetramethyl-)	XXXXX-XX-X	**	7.90 (V)	PE	5504
$C_6H_{16}N_4^+$	$C_2H_4N_4(CH_3)_4$ (1,2,4,5-Tetrazine, hexahydro-1,2,4,5-tetramethyl-)	20717-38-8	**	7.90 (V)	PE	4277
$C_6H_{16}N_4^+$			**	7.90 (V)	PE	5215
$C_6H_{16}N_4^+$			**	7.90 (V)	PE	5353
$C_6H_{16}N_4^+$			**	9.00 (V)	PE	4277
$C_7H_{16}N_4^+$	$C_2H_4N_4(CH_3)_2(C_3H_6)$ (6H-Pyrazolo[1,2-a][1,2,4,5]tetrazine,hexahydro-2,3-dimethyl-)	70517-50-9	**	7.76 (V)	PE	5489
$C_8H_{12}N_4^+$	<i>trans</i> -(NCC(CH ₃) ₂) ₂ N=N	34241-39-9	**	9.62 (V)	PE	4429
$C_8H_{16}N_4^+$	$C_2H_4N_4(CH_3)_2(C_4H_6)$ (Pyridazino[1,2-a][1,2,4,5]tetrazine,1,2,3,4,6,9-hexahydro-2,3-dimethyl-)	53233-92-4	**	7.77 (V)	PE	5489
$C_8H_{16}N_4^+$	$C_2H_4N_4(C_3H_6)_2$ (1H,5H,7H,11H-Dipyrazolo[1,2-a:1',2'-d][1,2,4,5]tetrazine,tetrahydro-)	37882-92-1	**	7.55 (V)	PE	5489
$C_8H_{16}N_4^+$	$C_8H_{16}N_4$ (1,3,6,8-Tetraazatricyclo[4.4.1.1 ^{3,8}]dodecane)	51-46-7	**	7.389	PE	4214
$C_8H_{18}N_4^+$	$C_2H_4N_4(CH_3)_2(C_4H_8)$ (Pyridazino[1,2-a][1,2,4,5]tetrazine,octahydro-2,3-dimethyl-)	61012-98-4	**	7.69 (V)	PE	5489
$C_8H_{20}N_4^+$	$(N_2(C_2H_5)_2)_2$ (2-Tetrazene,1,1,4,4-tetraethyl-)	13304-29-5	**	7.1 (V)	PE	5604
$C_8H_{20}N_4^+$	$C_2H_2N_4(CH_3)_6$ (1,2,4,5-Tetrazine, hexahydro-1,2,3,4,5,6-hexamethyl- <i>trans</i> -)	71899-35-9	**	7.63 (V)	PE	5215
$C_9H_{24}N_4^+$	$C(N(CH_3)_2)_4$	10524-51-3	**	7.19 (V)	PE	4588

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{10}H_{16}N_4^+$	$C_2H_4N_4(C_4H_6)_2$ (6H,13H-Dipyridazino[1,2-a:1',2'-d][1,2,4,5-tetrazine,1,4,8,11-tetrahydro-)	37882-93-2	**	7.51 (V)	PE	5489
				7.73 (V)	PE	5215
$C_{10}H_{20}N_4^+$	$C_2H_4N_4(C_4H_8)_2$ (6H,13H-Dipyridazino[1,2-a:1',2'-d][1,2,4,5]tetrazine,octahydro-)	5767-20-4	**	7.46 (V)	PE	5489
				<5.41	PI	5277
	$(C_3H_4N_2(CH_3)_2)_2$ (Imidazolidine,2-(1,3-dimethyl-2-imidazolidinylidene)-1,3-dimethyl-)	1911-01-9	**	6.06 (V)	PE	3512
$C_{10}H_{24}N_4^+$	$((CH_3)_2N)_4C_2$	996-70-3	**	<5.36	PI	5277
				5.95 (V)	PE	3512
$C_{12}H_6N_4^+$	$C_{12}H_6N_4$ (2,3-Pyrazinedicarbonitrile,5-phenyl-)	52109-66-7	**	8.68	EI	5488
$C_{12}H_{26}N_4^+$	$((CH_3)_2N)_2C=CH_2$	10596-53-9	**	5.60±0.10	PI	5278
$C_{12}H_{28}N_4^+$	$((CH_3)_2CH)_2NN_2$ (2-Tetrazene,1,1,4,4-tetrakis(1-methylethyl))	13304-31-9	**	6.9 (V)	PE	5604
$C_{13}H_7N_4^+$	$C_{13}H_8N_4$ (2,3-Pyrazinedicarbonitrile,5-methyl-6-phenyl-)	52109-67-8	H	9.35	EI	5488
$C_{13}H_8N_4^+$	$C_{13}H_8N_4$ (2,3-Pyrazinedicarbonitrile,5-methyl-6-phenyl-)	52109-67-8		8.65	EI	5488
$C_{16}H_{18}N_4^+$	$C_{16}H_{18}N_4$ (Aniline, 2,2'-[1,2-ethanediy]bis(nitrilomethylidene))bis-)	XXXXX-XX-X	**	7.83±0.04	EI	4668
$C_{16}H_{28}N_4^+$	$(C_8H_{14}N_2)_2$ (9-Azabicyclo[3.3.1]nonane,9,9'-azobis-)	67282-66-0	**	7.07 (V)	PE	5091
$C_{18}H_8N_4^+$	$C_{18}H_8N_4$ (Dibenzof[h]quinoxaline-2,3-dicarbonitrile)	55408-49-6	**	8.20	EI	5488
$C_{18}H_{24}N_4^+$	$C_{18}H_{24}N_4$ (1,2,4,5-Tetrazine, hexahydro-1,4-dimethyl-2,5-bis(phenylmethyl)-)	61012-91-7	**	7.71 (V)	PE	5215
$C_{30}H_{32}N_4^+$	$C_2H_4N_4(CH_2C_6H_5)_4$ (1,2,4,5-Tetrazine, hexahydro-1,3,5,6-tetrakis(4-methylphenyl)-)	38422-60-5	**	7.44 (V)	PE	5215
$C_{36}H_{46}N_4^+$	$C_{20}H_6N_4(C_2H_5)_8$ (21H, 23H-Porphine,2,3,7,8,12,13,17,18-octaethyl-)	2683-82-1	**	6.25 (V)	PE	4557
				6.39±0.03 (V)	PE	5476
$C_{44}H_{30}N_4^+$	$C_{20}H_{10}N_4(C_6H_5)_4$ (21H, 23H-Porphine,5,10,15,20-tetraphenyl-)	917-23-7	**	6.39 (V)	PE	4557

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₄₄H₃₀N₄⁺	C ₂₀ H ₁₀ N ₄ (C ₆ H ₅) ₄	917-23-7	**	6.32±0.2	OTH	4962
C₅H₅N₅⁺	C ₅ H ₃ N ₄ (NH ₂) (1H-Purin-6-amine)	73-24-5	**	8.44±0.03 (V)	PE	4445
			**	8.3±0.1	EI	5555
			**	8.48 (V)	PE	4644
			**	8.48 (V)	PE	5492
C₆H₃N₅⁺	C ₅ H ₃ N(CN)N ₃ (Tetrazolo[1,5- <i>a</i>]pyridine-8-carbonitrile)	40306-97-6	**	9.22 (V)	PE	5396
C₆H₇N₅⁺	C ₅ H ₃ N ₄ (NHCH ₃) (1H-Purin-6-amine, N-methyl-)	443-72-1	**	8.15 (V)	PE	5492
			**	8.15 (V)	PE	4644
			**	8.39 (V)	PE	4644
	C ₅ H ₂ N ₄ (CH ₃)NH ₂ (7H-Purin-6-amine, 7-methyl-)	935-69-3	**	8.64 (V)	PE	5492
	C ₅ H ₂ N ₄ (NH ₂)CH ₃ (9H-Purin-6-amine, 9-methyl-)	700-00-5	**	8.39 (V)	PE	5492
	C ₅ H ₂ N ₄ (NH ₂)CH ₃ (1H-Purin-6-amine,9-methyl-)	XXXXXX-XX-X	**	7.9±0.1	EI	5555
C₇H₉N₅⁺	C ₅ H ₂ N ₄ (CH ₃)NHCH ₃ (9H-Purin-6-amine, N,9-dimethyl-)	2009-52-1	**	7.95 (V)	PE	5492
	C ₅ H ₃ N ₄ N(CH ₃) ₂ (1H-Purin-6-amine,N,N-dimethyl-)	938-55-6	**	7.78 (V)	PE	5492
C₁₁H₁₅N₅⁺	C ₁₁ H ₁₃ N ₄ NH ₂ (9H-Purin-6-amine, 9-cyclohexyl-)	4235-94-3	**	9.1	CTS	3915
C₄H₁₂N₆⁺	C ₂ H ₄ N ₂ H ₂ N ₂ C ₂ H ₄ N ₂ H ₂ ([1,2,4,5]Tetrazino[1,2- <i>a</i>][1,2,4,5]tetrazine,octahydro-)	1743-13-1	**	11.05 (V)	PE	5381
C₃₂H₁₈N₈⁺	C ₃₂ H ₁₈ N ₈ (29H,31H-Phthalocyanine)	574-93-6	**	7.36±0.10	EI	3829
BCH₈N⁺	(CH ₃ NH ₂)(BH ₃)	1722-33-4	**	9.66±0.01	PE	3699
BC₂H₈N⁺	(CH ₃) ₂ NBH ₂	1838-13-7	**	9.51	PE	3584
BC₂H₉N⁺	((CH ₃) ₂ NH)(BH ₂)	74-94-2	**	9.39±0.01	PE	3699
BC₃H₁₂N⁺	((CH ₃) ₃ N)(BH ₃)	75-22-9	**	9.28±0.2	PE	3699
BC₄H₁₂N⁺	(CH ₃) ₂ NB(CH ₃) ₂	1113-30-0	**	8.92	PE	3584
			**	8.92 (V)	PE	4243
			**	9.02 (V)	PE	5581

Ion	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
(state)						
BC₅H₈N⁺	C ₅ H ₅ N·BH ₃ (Pyridine, compound with borane (1:1))	110-51-0	**	9.72 (V)	PE	4536
BC₆H₁₀N⁺	C ₅ H ₄ N(CH ₃)·BH ₃ (Pyridine, 4-methyl-, compound with borane (1:1))	3999-39-1	**	9.50 (V)	PE	4536
BC₆H₁₂N⁺	(C ₃ H ₆) ₂ BN (1H,5H-[1,2]Azaborolo[1,2-a][1,2]azaborole,tetrahydro-)	16153-13-2	**	8.80 (V)	PE	5609
			**	8.06	PE	3584
BC₉H₁₆N⁺	C ₅ H ₄ N(<i>tert</i> -C ₄ H ₉)·BH ₃ (Pyridine, 4-(1,1-dimethylethyl)-, compound with borane (1:1))	56898-51-2	**	9.45 (V)	PE	4536
BC₁₀H₂₀N⁺	(CH ₃) ₂ BNC ₈ H ₁₄ (1-Azabicyclo[3.3.1]nonane,1-dimethylboryl-)	XXXXX-XX-X	**	8.53 (V)	PE	5581
	(CH ₃) ₂ NBC ₈ H ₁₄ (Methanamine,N-methyl-N-(9-boratabicyclo[3.3.1]non-9-yl))	XXXXX-XX-X	**	8.73 (V)	PE	5581
BC₁₆H₂₈N⁺	C ₈ H ₁₄ BNC ₈ H ₁₄ (1-Azabicyclo[3.3.1]nonane,1-(9-boratabicyclo[3.3.1]non-9-yl)-)	XXXXX-XX-X	**	8.31 (V)	PE	5581
BC₄H₁₁N₂⁺	C ₂ H ₅ BN ₂ (CH ₃) ₂ (1,3,2-Diazaborolidine, 1,3-dimethyl-)	38151-26-7	**	7.55 (V)	PE	4298
BC₄H₁₃N₂⁺	((CH ₃) ₂ N) ₂ BH	2386-98-3	**	7.76	PE	3584
BC₅H₁₅N₂⁺	((CH ₃) ₂ N) ₂ B(CH ₃)	6914-63-2	**	7.63	PE	3584
B₂C₆H₁₈N₂⁺	((CH ₃) ₂ BNCH ₃) ₂ (Boranediamine,N-(dimethylboryl)-N,N',N',1-tetramethyl)	73263-55-5	**	9.02 (V)	PE	5628
BC₈H₁₇N₂⁺	C ₂ H ₂ BN ₂ (CH ₃) ₂ C(CH ₃) ₃ (1H-1,3,2-Diazaborole, 2-(1,1-dimethylethyl)-2,3-dihydro-1,3-dimethyl-)	53088-51-0	**	7.25 (V)	PE	4298
BC₈H₁₉N₂⁺	C ₂ H ₄ BN ₂ (CH ₃) ₂ C(CH ₃) ₃ (1,3,2-Diazaborolidine, 2-(1,1-dimethylethyl)-1,3-dimethyl-)	53088-52-1	**	7.46 (V)	PE	4298
BC₉H₁₁N₂⁺	C ₆ H ₅ C ₂ H ₃ BN ₂ CH ₃ (1H-1,3,2-Diazaborole, 2,3-dihydro-1-methyl-2-phenyl-)	53088-50-9	**	7.53 (V)	PE	4298
BC₉H₁₃N₂⁺	C ₆ H ₅ C ₂ H ₃ BN ₂ CH ₃ (1,3,2-Diazaborolidine, 1-methyl-2-phenyl-)	6076-64-8	**	7.91 (V)	PE	4298
BC₁₀H₁₃N₂⁺	C ₆ H ₅ C ₂ H ₂ BN ₂ (CH ₃) ₂ (1H-1,3,2-Diazaborole, 2,3-dihydro-1,3-dimethyl-2-phenyl-)	41422-89-3	**	7.34 (V)	PE	4298

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
BC₁₀H₁₅N₂⁺	C ₆ H ₅ C ₂ H ₄ BN ₂ (CH ₃) ₂ (1,3,2-Diazaborolidine, 1,3-dimethyl-2-phenyl-)	5709-94-4	**	7.48 (V)	PE	4298
B₂C₃H₁₁N₃⁺	N ₃ B ₂ H ₂ (CH ₃) ₃ (1,2,4,3,5-Triazadiborolidine, 1,2,4-trimethyl-)	53246-11-0	**	7.78 (V)	PE	4526
	N ₃ B ₂ H ₂ (CH ₃) ₃ (1,2,4,3,5-Triazadiborolidine, 1,3,5-trimethyl-)	40392-35-6	**	7.76 (V)	PE	4526
B₃C₃H₁₂N₃⁺	C ₃ H ₁₂ B ₃ N ₃ (Borazine, 1,3,5-trimethyl-)	1004-35-9	**	8.99 (V)	PE	3943
			**	9.28 ± 0.02	PE	3506
	C ₃ H ₁₂ B ₃ N ₃ (Borazine, 2,4,6-trimethyl-)	5314-85-2	**	9.50 (V)	PE	3943
			**	9.64 ± 0.03	PE	3506
B₂C₄H₁₃N₃⁺	N ₃ B ₂ H(CH ₃) ₄ (1,2,4,3,5-Triazadiborolidine, 1,2,3,5-tetramethyl-)	31732-40-8	**	7.51 (V)	PE	4526
	N ₃ B ₂ H(CH ₃) ₄ (1,2,4,3,5-Triazadiborolidine, 1,3,4,5-tetramethyl-)	40392-34-5	**	7.73 (V)	PE	4526
B₂C₅H₁₅N₃⁺	N ₃ B ₂ (CH ₃) ₅ (1,2,4,3,5-Triazadiborolidine, 1,2,3,4,5-pentamethyl-)	31732-41-9	**	7.47 (V)	PE	4526
BC₆H₁₄N₃⁺	C ₆ H ₁₄ BN ₃ ([1,3,2]Diazaborino[1,2-a][1,3,2]diazaborine, octahydro-)	1730-15-0	**	7.90	PE	3584
BC₆H₁₈N₃⁺	B(N(CH ₃) ₂) ₃	4375-83-1	**	7.60 (V)	PE	3704
B₃C₆H₁₈N₃⁺	C ₆ H ₁₈ B ₃ N ₃ (Borazine, hexamethyl-)	877-07-6	**	8.53 (V)	PE	3943
B₂C₈H₂₁N₃⁺	N ₃ B ₂ (CH ₃) ₄ C(CH ₃) ₃ (1,2,4,3,5-Triazadiborolidine, 4-(1,1-dimethylethyl)-1,2,3,5-tetramethyl-)	57877-83-5	**	7.45 (V)	PE	4526
B₂C₆H₁₈N₄⁺	B ₂ N ₄ (CH ₃) ₆ (1,2,4,5,3,6-Tetrazadiborine, hexahydro-1,2,3,4,5,6-hexamethyl-)	7318-93-6	**	6.83 (V)	PE	4299
B₂C₈H₂₄N₄⁺	((CH ₃) ₂ N) ₂ BB(N(CH ₃) ₂) ₂	1630-79-1	**	7.3 (V)		3512
			**	7.58	PE	3584
B₂C₇H₂₁N₅⁺	N ₃ B ₂ (CH ₃) ₃ (N(CH ₃) ₂) ₂ (1,2,4,3,5-Triazadiborolidine-3,5-diamine, N,N,N',N',1,2,4-heptamethyl-)	53246-08-5	**	7.05 (V)	PE	4526
B₃C₈H₂₄N₅⁺	C ₈ H ₂₄ B ₃ N ₅ (Boranediamine, N,N,N',N'-tetramethyl-1-(2,3,4,5-tetramethyl-1,2,4,3,5-triazadiborolidin-1-yl)-)	53324-00-8	**	~7.29 (V)	PE	4526
	C ₈ H ₂₄ B ₃ N ₅ (Boranediamine, N,N,N',N'-tetramethyl-1-(1,2,3,5-tetramethyl-1,2,4,3,5-triazadiborolidin-4-yl)-) (RX N ₃ B ₂ (CH ₃) ₄ B(N(CH ₃) ₂) ₂)	53323-99-2	**	~7.2 (V)	PE	4526

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
B₂C₈H₂₄N₆⁺	B ₂ N ₄ (CH ₃) ₄ (N(CH ₃) ₂) ₂ (1,2,4,5,3,6-Tetrazadiborine-3,6-diamine, tetrahydro- <i>N,N,N',N'</i> ,1,2,4,5-octamethyl-)	54154-16-4	**	7.09 (V)	PE	4299
O⁺						
(¹ P ^o)	O	17778-80-2	**	14.040	S	5209
			**	13.618	PI	5000
(² P)			**	18.63	PE	3701
			**	14.0±0.5	EI	4436
			**	14.2±1	EI	4687
(⁴ S ^o)	O ₂	7782-44-7	O(³ P)	18.69±0.04	EI	4318
(⁴ S ^o)			O(¹ D)	20.52±0.05	EI	4318
(² D ^o)			O(³ P)	22.09±0.1	EI	4318
(³ P)	O ₃	10028-15-6	O ₂	15.21±0.1	PI	5004
	H ₂ O	7732-18-5	H ₂	19.0	EI	3967
			2H	26.8	EI	3967
(⁴ S)	CO	630-08-0	C(⁴ S)	23.44	EI	5126
	CO ₂	124-38-9		19.393±0.008	PI	4349
			CO	19±1	PI	5170
			CO	19.067	PE	5064
(⁴ S _u)			CO	19.071	PE	4886
			CO	19.05±0.05	EI	4693
				22.6±1.0	EI	4129
	NO	10102-43-9	N	20.1±0.3	EI	3945
	N ₂ O	10024-97-2	N ₂	15±1	PI	5170
	HOF	14034-79-8	HF	14.34	PI	3932
(⁴ S _u)	COS	463-58-1	CS ⁻	19.45±0.08	EI	4905
O⁺²						
	O ⁺ (² P)	14581-93-2	**	30	EI	3489
			**	32	EI	3489
(¹ D)			**	38	EI	3489
(⁵ S)			**	42	EI	3489
	CO	630-08-0	C(¹ D)	61	EI	3489
	CO ⁺	12144-04-6	C(¹ D)	47	EI	3489
O₂⁺						
(² Π _{3/2g})	O ₂	7782-44-7	**	12.127	PE	4675
(² Π _g)			**	12.07±0.01	PI	4020
(² Π _{1/2})			**	12.071±0.001	PE	4491
(² Π _g)			**	12.071	PE	5064
(² Π _g)			**	12.076±0.002	PE	4770
(² Π _{3/2g})			**	12.077	PE	3834
(² Π _g)			**	12.08	PE	4073
(² Π _{1/2g})			**	12.102	PE	3834
(² Π _g)			**	12.33±0.01 (V)	PE	4415
(⁴ Π _u)			**	16.101	PE	5064
(⁴ Π _u)			**	16.105	PE	3664
(² Π _u)			**	16.5	PE	3698
(² Π _u)			**	17.15	PE	5064
(² Π _u)			**	~17.45	PE	3534
(² Φ _u)			**	17.5	PE	3698
(⁴ Σ _g ⁻)			**	18.171	PE	5064
(² Δ _g)			**	18.803±0.006	PE	4288
(² Δ _g)			**	18.81	PE	3534
(² Φ _u)			**	19.1±0.01	PE	5142
(² Δ _g)			**	19.9±0.01	PE	5142
(² Σ _g ⁻)			**	20.296	PE	5064
(² Π _u)			**	22.8±0.1	PE	3975
(⁴ Σ _u ⁻)			**	24.6	PE	3975
(⁴ Σ _g ⁻)			**	39.7 (V)	PE	4629
(² Σ _g ⁻)			**	40.33 (V)	PE	4629

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
O_2^+	O_2	7782-44-7	**	12.0 ± 0.5	EI	4436
			**	12.2 ± 0.2	EI	4131
			**	60.5 ± 0.8	EI	5346
	O_3	10028-15-6	O	13.125 ± 0.004	PI	5004
O_2^{+2} ($^3\Pi_g, ^3\Sigma_u^-$) O_2 ($^3\Pi_u$)		7782-44-7	**	43.0 ± 0.5	OTH	5007
			**	48.0 ± 1.0	OTH	5007
O_3^+ (2A_1) (2A_1) (2A_1) (2A_1) (2A_1) (2A_2) (2B_2) (2A_2) (2B_2) (2B_2) (2A_2) (2A_2) (2B_2) (2A_1) ($^2B_1, ^2B_2, ^2A_1, ^2B_2$) ($^2B_1, ^2B_2$) (2A_1)	O_3	10028-15-6	**	12.519 ± 0.004	PI	5004
			**	$12.3\pm0.1?$	PE	4539
			**	12.44 ± 0.01	PE	4239
			**	12.53 ± 0.1	PE	4170
			**	12.56	PE	4169
			**	13.02 (V)	PE	4169
			**	13.02 (V)	PE	4239
			**	13.03 ± 0.02	PE	4170
			**	13.57 ± 0.01	PE	4170
			**	13.57 (V)	PE	4169
			**	13.57 (V)	PE	4239
			**	15.57 (V)	PE	4239
			**	16.54 (V)	PE	4239
			**	17.45 (V)	PE	4239
			**	19.99 (V)	PE	4239
			**	20.3 ± 0.1 (V)	PE	4170
			**	24.5 (V)	PE	4239
HO^+ ($^3\Sigma^-$) ($^1\Delta$)	OH	3352-57-6	**	13.01 (V)	PE	4773
			**	15.20 (V)	PE	4773
			**	13.5 ± 1.0	EI	4054
			**	12.88	OTH	3932
	H_2O	7732-18-5	H	18.115 ± 0.008	PI	5146
			H	18.08 ± 0.05	EI	5046
			H	18.2	EI	3967
$HCOOH$	64-18-6	HCO	17.97 ± 0.06	PI	4177	
HO^+	14034-79-8	F	15.07	PI	3932	
OD^+	D_2O	7789-20-0	D	18.219 ± 0.008	PI	5146
			D	18.19 ± 0.03	PE	4247
H_2O^+ (2B_1) (2B_1) (2A_1) (2B_2) (2B_1) (2B_2) (2B_1) (2B_2) (2B_1) (2B_1) (2B_1) (2B_1) (2B_1) (2B_1) (2B_1) (2B_1) (2B_1)	H_2O	7732-18-5	**	12.612	S	5101
			**	12.619 ± 0.006	S	3983
			**	12.6	PI	5479
			**	13.8	PI	5479
			**	17.2	PI	5479
			**	11.8 (V)	PE	4845
			**	12.6	PE	4623
			**	12.60 ± 0.02 (V)	PE	4970
			**	12.61 (V)	PE	4537
			**	12.61 (V)	PE	4850
			**	12.615 ± 0.001	PE	4351
			**	12.615 ± 0.001	PE	5506
			**	12.616	PE	5064
			**	12.619	PE	3941
			**	12.62	PE	3719
			**	12.624	PE	3530
			**	12.624	PE	4602

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
H₂O⁺	H ₂ O	7732-18-5	**	12.627	PE	5626
				13.78	PE	3719
				13.8	PE	4623
				13.930±0.010	PE	3530
				14.75±0.03 (V)	PE	4970
				14.8	PE	3941
				17.02	PE	3719
				17.2	PE	4623
				17.378±0.008	PE	4351
				17.390	PE	3530
				18.54	PE	3941
				18.74±0.04 (V)	PE	4970
				32.2	PE	4623
				32.2 (V)	PE	3719
				32.61±0.05 (V)	PE	4970
				12.63±0.03	EI	5046
				12.7	EI	3967
	H ₂ ¹⁸ O	14314-42-2	**	12.615±0.001	PE	5506
HDO⁺	HDO	14940-63-7	**	12.630	PE	5626
D₂O⁺	D ₂ O	7789-20-0	**	12.636±0.006	S	3983
				12.637	S	5101
				12.633±0.001	PE	4351
				12.633±0.001	PE	5506
				12.633	PE	3530
				12.637	PE	4602
				12.639	PE	5626
				13.930±0.010	PE	3530
				17.412±0.008	PE	4351
				12.65±0.03	EI	5046
	D ₂ O		**			
H₃O⁺	(H ₂ O) ₂	25655-83-8	OH	11.73±0.03	PI	5015
	C ₂ H ₅ OH	64-17-5		14.30±0.02	EI	3487
HO₂⁺	HO ₂	3170-83-0	**	11.67±0.15	EI	4920
H₂O₂⁺	H ₂ O ₂	7722-84-1	**	10.54	PE	4577
				11.69 (V)	PE	4168
H₄O₂⁺	(H ₂ O) ₂	25655-83-8	**	<11.21±0.09	PI	5015
LiO⁺	LiO	12142-77-7	**	8.45±0.20	EI	3909
Li₂O⁺	Li ₂ O	12057-24-8	**	6.19±0.20	EI	3909
BO⁺	BO	12505-77-0	**	13.2±0.2	EI	4483
		13840-87-4	**	13.0±0.5	EI	3473
BO₂⁺	BO ₂	13840-88-5	**	14.0±1.0	EI	4054

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
HBO₂⁺						
	BHO ₂	13460-50-9	**	13.5±1.0	EI	4054
CO⁺						
	CO	630-08-0	**	11.3969	S	5167
(²Σ ⁺)			**	14.014	S	3760
(²Π _{1/2})			**	16.550	S	3760
(²Σ ⁺)			**	19.672	S	3760
(²Σ _{2p})			**	14.0	PI	5479
(²Π _{2p})			**	16.5	PI	5479
(²Σ _{2s})			**	19.7	PI	5479
(²Σ ⁺)			**	14.01	PE	4073
(²Σ _{2p})			**	14.01 (V)	PE	4022
(²Σ ⁺)			**	14.01 (V)	PE	5055
(²Π)			**	16.55	PE	4073
(²Π)			**	16.91 (V)	PE	4022
(²Σ _u ⁺)			**	19.69 (V)	PE	3714
(²Σ _{2s})			**	19.72 (V)	PE	4022
(²Σ ⁺)			**	39.0	PE	3975
(²Σ ⁺)			**	39.7 (V)	PE	4615
(²Σ ⁺)			**	14.07±0.05	EI	4958
	CO ₂	124-38-9	O(³S)	29.0	PI	4095
			O	19±2	PI	5170
(²Σ ⁺)			O	19.466	PE	4886
			O	19.466	PE	5064
(²Σ ⁺)			O	21.433	PE	4886
(²Π)			O	21.976	PE	4886
			O	19.42±0.075	EI	4693
				20.9±1.0	EI	4129
	COS	463-58-1	S?	15.6	EI	3779
CO⁺²						
	CO	630-08-0	**	41.8±0.5	EI	4958
CO₂⁺						
(²Π _g)	CO ₂	124-38-9	**	13.77	PI	4932
(X²Π _{3/2g})			**	13.773±0.002	PI	3925
(²Π _{3/2g})			**	13.774±0.003	PI	4349
(X²Π _{3/2g})			**	13.776±0.008	PI	4069
(²Π _{1/2g})			**	13.788±0.003	PI	4349
(²Σ _g ⁺)			**	19.391±0.001	PI	4886
			**	36.2	PI	5127
			**	13±1	PI	5170
			**	35±3	PI	5170
(²Π _{3/2g})			**	13.776±0.002	PE	4910
(²Π _{1/2g})			**	13.797±0.002	PE	4910
(²Π _{3/2u} , ²Π _{1/2u})			**	17.316±0.003	PE	4910
(²Σ _u ⁺)			**	18.076±0.002	PE	4910
(²Σ _g ⁺)			**	19.395±0.003	PE	4910
(²Π _g)			**	13.773 (V)	PE	4886
			**	13.776±0.002	PE	5256
(²Π _g)			**	13.777±0.002	PE	5132
(²Π _g)			**	13.78	PE	4073
(²Π _g)			**	13.78 (V)	PE	4850
(²Π _g)			**	13.788	PE	5064
(²Π _g)			**	13.79 (V)	PE	5055
(²Π _g)			**	13.80±0.01	PE	3965
(²Π _u)			**	17.31 (V)	PE	4886
(²Π _u)			**	17.311±0.002	PE	5132
(²Π _u)			**	17.34±0.01	PE	3965
(²Σ _u ⁺)			**	18.068±0.002	PE	5132
(²Σ _u ⁺)			**	18.07 (V)	PE	4886

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
CO_2^+ ($^2\Sigma_u^+$) ($^2\Sigma_g$) ($^2\Sigma_g^+$) ($^2\Sigma_u$) ($^2\Sigma_g$)	CO_2	124-38-9	**	18.08 ± 0.01	PE	3965
			**	19.386 ± 0.002	PE	5132
			**	19.39 ± 0.01	PE	3965
			**	37	PE	4095
			**	38.4	PE	4095
			**	13.79 ± 0.05	EI	5240
			**	13.83 ± 0.05	EI	4693
			**	13.89 ± 0.03	EI	4877
			**	13.92 ± 0.2	EI	5588
			**	37.2 ± 0.5	EI	5240
C_3O_2^+	C_3O_2	504-64-3	**	10.605	PE	3728
CHO^+ ($^2A'$)	HCO	17030-74-9	**	8.55 ± 0.01	PE	5008
	HCHO	50-00-0	H	11.89 ± 0.03	PI	3554
	CH_3OH	67-56-1	$\text{H}_2 + \text{H}$	13.06 ± 0.10	PI	3554
	CD_3OH	1849-29-2	$\text{D}_2 + \text{D}$	13.8 ± 0.6	EI	5173
	CH_3CHO	75-07-0	CH_3	11.79 ± 0.03	PI	4177
	CH_3CDO	4122-13-8		12.67	PI	5270
	CD_3CHO	19901-15-6		11.98	PI	5270
			CH_3	12.03 ± 0.03	PI	4350
				12.03	PI	5270
	$\text{C}_2\text{H}_4\text{O}$ (Oxirane)	75-21-8	CH_3	11.54 ± 0.03	PI	4350
	$(\text{CH}_3)_2\text{O}$	115-10-6		13.96 ± 0.2	EI	4071
	CH_3OCD_3	13725-27-4		13.97 ± 0.2	EI	4071
	$\text{C}_2\text{H}_5\text{OCD}_3$	16995-14-5		13.13 ± 0.2	EI	4071
	$\text{C}_4\text{H}_4\text{O}$ (Furan)	110-00-9	C_3H_3	13.2 ± 0.1	PE	5289
	HCOOH	64-18-6	OH	12.79 ± 0.03	PI	4177
			OH	13.0 ± 0.1	PI	5135
	HNCO	420-05-3	N	15.52	EI	4507
	HCONH ₂	75-12-7		13.70	EI	4878
	HCONHCH ₃	123-39-7		12.40	EI	4878
	HCON(CH ₃) ₂	68-12-2		14.50	EI	4878
CDO^+	DCO	15233-68-8	**	8.56 ± 0.01	PE	5008
	CD_3OH	1849-29-2	$\text{D}_2 + \text{H}$	13.53 ± 0.5	EI	5173
	CD_3OD	811-98-3		14.88	PI	5174
	CH_3CDO	4122-13-8		11.95	PI	5270
	CD_3CHO	19901-15-6		12.65	PI	5270
	CH_3OCD_3	13725-27-4		13.87 ± 0.2	EI	4071
	$\text{C}_2\text{H}_5\text{OCD}_3$	16995-14-5		13.57 ± 0.2	EI	4071
CH_2O^+	H_2CO	50-00-0	**	10.874 ± 0.002	S	5071
			**	10.88 ± 0.02	PI	3554
			**	10.90 ± 0.03	PI	3765
			**	10.1 (V)	PE	4467
			**	10.885 ± 0.005	PE	5519
	CH_3OH	67-56-1	H_2	12.05 ± 0.12	PI	3554
CHDO^+	CD_3OH	1849-29-2	D_2	12.78 ± 0.3	EI	5173
CD_2O^+	D_2CO	XXXXXX-XX-X	**	10.901 ± 0.006	S	5071
	CD_3OH	1849-29-2	HD	12.28 ± 0.4	EI	5173

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
CH₃O⁺	CH ₃ OH	67-56-1	H	11.55±0.03	PI	3554
			H	11.69	EI	4915
			H	11.76±0.11	EI	5503
	(CH ₃) ₂ O	115-10-6	CH ₃	≤11.8	EI	4915
			CH ₃	12.42±0.1	EI	4071
	C ₂ H ₅ OH	13725-27-4	CH ₃	11.30	EI	4915
	C ₂ H ₅ OCH ₃	540-67-0	C ₂ H ₅	≤11.7	EI	4915
				12.86±0.1	EI	4071
	<i>n</i> -C ₃ H ₇ OH	71-23-8	C ₂ H ₅	11.16±0.03	EI	3626
	(C ₂ H ₅) ₂ O	60-29-7		11.92	EI	5072
CHD₂O⁺	CD ₃ OH	1849-29-2	D	11.30±0.3	EI	5173
	C ₂ H ₅ OCD ₃	16995-14-5		12.86±0.05	EI	4071
CD₃O⁺	CD ₃ OH	1849-29-2	H	11.40±0.5	EI	5173
	CD ₃ OD	811-98-3	D	12.71	PI	5174
CH₄O⁺	CH ₃ OH	67-56-1	**	10.83±0.03	PI	3554
			**	10.85±0.01	PI	4957
			**	10.846±0.002	PE	4770
			**	10.86 (V)	PE	4850
			**	10.94 (V)	PE	4068
			**	10.95	PE	4087
			**	10.95 (V)	PE	4032
			**	10.95 (V)	PE	4884
			**	10.95 (V)	PE	5249
			**	10.96 (V)	PE	3941
			**	10.97±0.03 (V)	PE	4484
			**	10.90±0.03	EI	4877
			**	10.90±0.12	EI	5503
CH₄O²⁺	CH ₃ OH	67-56-1	**	33.2±0.5	OTH	5147
CH₃DO⁺	CH ₃ OD	4206-31-9	**	10.861±0.002	PE	4770
CHD₃O⁺	CD ₃ OH	1849-29-2	**	10.84±0.1	EI	5173
CD₄O⁺	CD ₃ OD	811-98-3	**	11.00	PI	5174
			**	10.885±0.002	PE	4770
C₂H₂O⁺	CH ₂ =C=O	463-51-4	**	9.614±0.008	PI	5458
			**	9.60 (V)	PE	5610
			**	9.61±0.02	PE	5458
			**	9.63±0.02	PE	5211
	CH ₃ CHO	75-07-0	H ₂ ?	13.06±0.09	PI	4350
	C ₂ H ₄ O	75-21-8	H ₂ ?	13.07±0.05	PI	4350
	(Oxirane)					
	C ₃ H ₄ (=O)	5009-27-8		9.9±0.1	EI	4689
	(Cyclopropanone)					
	C ₄ H ₄ O	110-00-9	C ₂ H ₂	11.80±0.10	PE	5289
	(Furan)					

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_2H_2O^+$	-					
	C_3H_6O (Cyclobutanone)	1191-95-3	C_2H_4	10.53 ± 0.15	EI	3794
	C_3H_3NO (Oxazole)	288-42-6	HCN	12.15 ± 0.6	EI	5400
$C_2H_3O^+$	CH_3CHO	75-07-0	H	10.82 ± 0.03	PI	4177
			H	10.90 ± 0.03	PI	4350
			H	10.90	PI	5270
	C_2H_4O (Oxirane)	75-21-8	H	11.62 ± 0.05	PI	4350
	CH_3CDO	4122-13-8	D	10.92	PI	5270
	$(CH_3)_2CO$	67-64-1	CH_3	10.52 ± 0.02	PI	5412
			CH_3	12.22	PE	5066
			CH_3	10.28 ± 0.05	EI	3626
				10.30	EI	4535
			CH_3	11.3	EI	3550
	$CH_3COC \equiv CH$	1423-60-5	C_2H	12.10 ± 0.10	PE	5289
	$C_2H_5COCH_3$	78-93-3		10.69	EI	4535
	<i>iso</i> - $C_3H_7COCH_3$	563-80-4		10.68	EI	4535
	<i>tert</i> - $C_4H_9COCH_3$	75-97-8		~ 11.3	EI	4535
	CH_3COOCH_3	79-20-9		10.94	EI	5070
	$C_6H_5OOCCH_3$ (Acetic acid, phenyl ester)	122-79-2	<i>cyclo</i> - C_6H_5O	12.78 ± 0.2	EI	3484
			C_6H_5O	12.83 ± 0.03	EI	3483
	$C_6H_4(CH_3)OOCCH_3$ (Acetic acid, 3-methylphenyl ester)	122-46-3	$C_6H_4(CH_3)O$	13.83 ± 0.2	EI	3484
	$C_6H_4(CH_3)OOCCH_3$ (Acetic acid, 4-methylphenyl ester)	140-39-6		13.97 ± 0.2	EI	3484
	$C_6H_5CH_2CH_2OCOCH_3$	103-45-7		11.70	EI	3590
	(Acetic acid, 2-phenylethyl ester)					
	$C_6H_4(CH_3)CH_2CH_2OCOCH_3$	33709-40-9		11.90	EI	3590
	(Phenethyl alcohol, <i>m</i> -methyl-, acetate)					
	$C_6H_4(CH_3)CH_2CH_2OCOCH_3$	22532-47-4		11.90	EI	3590
	(Phenethyl alcohol, <i>p</i> -methyl-, acetate)					
	$C_6H_4(OCH_3)OOCCH_3$	5451-83-2	$C_6H_4(OCH_3)O$	13.92 ± 0.2	EI	3484
	(Phenol, 3-methoxy-, acetate)					
	$C_6H_4(OCH_3)OOCCH_3$	1200-06-2	$C_6H_4(OCH_3)O$	14.57 ± 0.2	EI	3484
	(Phenol, 4-methoxy-, acetate)					
	$C_6H_4(OCH_3)CH_2CH_2OCOCH_3$	33709-39-6		11.80	EI	3590
	(Phenethyl alcohol, <i>m</i> -methoxy-, acetate)					
	$C_6H_4(OCH_3)CH_2CH_2OCOCH_3$	22532-51-0		12.20	EI	3590
	(Phenethyl alcohol, <i>p</i> -methoxy-, acetate)					
	$C_6H_4(COOH)OOCCH_3$	2345-34-8	$C_6H_4(COOH)O$	12.46 ± 0.2	EI	3484
	(Benzoic acid, 4-(acetyloxy)-)					
	CH_3CONH_2	60-35-5		11.70	EI	4878
	$CH_3CONHCH_3$	79-16-3		12.40	EI	4878
	$CH_3CON(CH_3)_2$	127-19-5		12.55	EI	4878
	$C_5H_8NCOCH_3$	19615-27-1		13.5	EI	4046
	(Pyridine, 1-acetyl-1,2,3,4-tetrahydro-)					
	$C_5H_{10}NCOCH_3$	618-42-8		15.1	EI	4046
	(Piperidine, 1-acetyl-)					
	$C_6H_5NHCOCH_3$	103-84-4		13.22 ± 0.03	EI	3483
	(Acetamide, <i>N</i> -phenyl-)					
	$C_6H_4(NH_2)CH_2CH_2OCOCH_3$	33709-38-5		12.30	EI	3590
	(Benzeneethanol, 4-amino-, acetate(ester))					
	$C_6H_4(NO_2)OOCCH_3$	1523-06-4		10.94 ± 0.2	EI	3484
	(Acetic acid, 3-nitrophenyl ester)					
	$C_6H_4(NO_2)OOCCH_3$	830-03-5		10.85 ± 0.2	EI	3484
	(Acetic acid, 4-nitrophenyl ester)					
	$((CH_3)_2C(NO)COCH_3)_2$	30442-79-6		11.60	EI	4809

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_2H_3O^+$	$(C_6H_{11}NO_2)_2$	68777-99-1		10.40	EI	4809
	$((CH_3)_2C(NO)OOCCH_3)_2$	68777-98-0		10.20	EI	4809
	$C_6H_4FOOCCH_3$	29650-44-0	C_6H_4FO	12.23 ± 0.03	EI	3483
	(Phenol, 2-fluoro-, acetate)					
	$C_6H_4FOOCCH_3$	405-51-6	C_6H_4FO	12.72 ± 0.03	EI	3483
	(Phenol, 4-fluoro-, acetate)					
	$C_6H_3F_2OOCCH_3$	36914-77-9		12.00 ± 0.03	EI	3480
	(Phenol, 2,4-difluoro-, acetate)					
	$C_6H_3F_2OOCCH_3$	36914-78-0		12.24 ± 0.03	EI	3480
	(Phenol, 2,6-difluoro-, acetate)					
	CH_3COCF_3	421-50-1		11.45	EI	3550
	$C_6H_4FNHCOCH_3$	399-31-5		13.59 ± 0.03	EI	3483
	(Acetamide, <i>N</i> -(2-fluorophenyl)-)					
	$C_6H_4FNHCOCH_3$	351-83-7		13.42 ± 0.03	EI	3483
	(Acetamide, <i>N</i> -(4-fluorophenyl)-)					
	$C_6H_3F_2NHCOCH_3$	399-36-0		13.18 ± 0.03	EI	3480
	(Acetamide, <i>N</i> -(2,4-difluorophenyl)-)					
	$C_6H_3F_2NHCOCH_3$	3869-29-5		13.80 ± 0.03	EI	3480
	(Acetamide, <i>N</i> -(2,6-difluorophenyl)-)					
	$C_6H_4ClOOCCH_3$	4525-75-1		12.55 ± 0.03	EI	3483
	(Acetic acid, 2-chlorophenyl ester)					
	$C_6H_4ClOOCCH_3$	13031-39-5		12.36 ± 0.2	EI	3484
	(Acetic acid, 3-chlorophenyl ester)					
	$C_6H_4ClOOCCH_3$	876-27-7		12.39 ± 0.03	EI	3483
	(Acetic acid, 4-chlorophenyl ester)					
	$C_6H_4ClCH_2CH_2OCOCH_3$	33709-41-0		12.73 ± 0.2	EI	3484
	(Phenethyl alcohol, <i>m</i> -chloro-, acetate)			11.60	EI	3590
	$C_6H_3Cl_2OOCCH_3$	6341-97-5		12.11 ± 0.03	EI	3480
	(Phenol, 2,4-dichloro-, acetate)					
	$C_6H_3Cl_2OOCCH_3$	28165-71-1		12.09 ± 0.03	EI	3480
	(Phenol, 2,6-dichloro-, acetate)					
	$C_6H_4ClNHCOCH_3$	533-17-5		13.91 ± 0.03	EI	3483
	(Acetamide, <i>N</i> -(2-chlorophenyl)-)					
	$C_6H_4ClNHCOCH_3$	539-03-7		13.00 ± 0.03	EI	3483
	(Acetamide, <i>N</i> -(4-chlorophenyl)-)					
	$C_6H_3Cl_2NHCOCH_3$	6975-29-7		13.08 ± 0.03	EI	3480
	(Acetamide, <i>N</i> -(2,4-dichlorophenyl)-)					
	$C_6H_3Cl_2NHCOCH_3$	17700-54-8		13.40 ± 0.03	EI	3480
	(Acetamide, <i>N</i> -(2,6-dichlorophenyl)-)					
	$C_6H_4BrCOOCH_3$	1829-37-4		12.24 ± 0.03	EI	3483
	(Phenol, 2-bromo-, acetate)					
	$C_6H_4BrOOCCH_3$	35065-86-2		12.36 ± 0.2	EI	3484
	(Phenol, 3-bromo-, acetate)					
	$C_6H_4BrOOCCH_3$	1927-95-3		12.87 ± 0.2	EI	3484
	(Phenol, 4-bromo-, acetate)					
	$C_6H_3Br_2OOCCH_3$	36914-79-1		13.06 ± 0.03	EI	3483
	(Phenol, 2,4-dibromo-, acetate)			12.01 ± 0.03	EI	3480
	$C_6H_3Br_2OOCCH_3$	28165-72-2		12.36 ± 0.03	EI	3480
	(Phenol, 2,6-dibromo-, acetate)					
	$C_6H_4BrNHCOCH_3$	614-76-6		14.68 ± 0.03	EI	3483
	(Acetamide, <i>N</i> -(2-bromophenyl)-)					
	$C_6H_4BrNHCOCH_3$	103-88-8		13.96 ± 0.03	EI	3483
	(Acetamide, <i>N</i> -(4-bromophenyl)-)					
	$C_6H_3Br_2NHCOCH_3$	23373-04-8		13.10 ± 0.03	EI	3480
	(Acetamide, <i>N</i> -(2,4-dibromophenyl)-)					
	$C_6H_3Br_2NHCOCH_3$	33098-80-5		13.21 ± 0.03	EI	3480
	(Acetamide, <i>N</i> -(2,6-dibromophenyl)-)					
	$C_6H_4IOOCCH_3$	32865-61-5	C_6H_4IO	12.47 ± 0.03	EI	3483
	(Phenol, 2-iodo-, acetate)					

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_2H_3O^+$	$C_6H_4IOOCCCH_3$ (Phenol, 4-iodo-, acetate)	33527-94-5	C_6H_4IO	12.74 ± 0.03	EI	3483
	$C_6H_3I_2OOCCH_3$ (Phenol, 2,4-diiodo-, acetate)	36914-80-4		12.15 ± 0.03	EI	3480
	$C_6H_3I_2OOCCH_3$ (Phenol, 2,6-diiodo-, acetate)	28165-73-3		12.02 ± 0.03	EI	3480
	$C_6H_4INHCOCH_3$ (Acetamide, <i>N</i> -(2-iodophenyl)-)	19591-17-4		13.56 ± 0.03	EI	3483
	$C_6H_4INHCOCH_3$ (Acetamide, <i>N</i> -(4-iodophenyl)-)	622-50-4		13.16 ± 0.03	EI	3483
$C_2D_3O^+$	CD_3CHO	19901-15-6	H	10.91	PI	5270
	$(CD_3)_2CO$	666-52-4	CD_3	10.56 ± 0.02	PI	5412
$C_2H_4O^+$	$C_4H_7(OH)$ (Cyclobutanol)	2919-23-5	C_2H_4	9.87	EI	4729
	$C_2H_3O(CH_2OH)$ (Oxiranemethanol)	556-52-5	CH_2O	10.30	EI	4729
	CH_3CHO	75-07-0	**	10.19	S	5273
			**	10.20 ± 0.02	PI	4177
			**	10.20 ± 0.03	PI	3765
			**	10.22 ± 0.01	PI	4350
			**	10.22	PI	5270
			**	10.2298 ± 0.0007	PI	4306
			**	10.20	PE	4471
			**	10.20	PE	4520
			**	10.21	PE	4224
			**	10.227 ± 0.005	PE	5519
			**	10.23 (V)	PE	4850
			**	10.24 ± 0.02	PE	4220
			**	10.26 (V)	PE	4513
			**	10.9 (V)	PE	4467
			**	10.23	EI	4729
	$CH_2=CHOH$	557-75-5	**	9.0 ± 0.15	OTH	4729
	C_2H_4O (Oxirane)	75-21-8	**	10.558 ± 0.1	PI	4868
			**	10.56 ± 0.01	PI	4350
			**	10.4 ± 0.1	PE	4990
			**	10.560	PE	4868
			**	10.568 (V)	PE	4527
			**	10.57	EI	4729
	C_2H_5OH	64-17-5	H_2	~ 10.45	EI	4729
	<i>iso</i> - C_3H_7OH	67-63-0	CH_4	10.23 ± 0.02	PI	5512
	$CH_2=CHOC_2H_5$	109-92-2	C_2H_4	10.19	EI	4729
	<i>n</i> - C_3H_7CHO	123-72-8	C_2H_4	10.52	EI	4729
	<i>n</i> - C_4H_9CHO	110-62-3	C_3H_6	11.40	EI	5264
	<i>iso</i> - C_4H_9CHO	26140-47-6	C_3H_6	10.57	EI	4729
	$(CH_3)_2CHC_2H_4CHO$	1119-16-0	C_4H_8	11.40	EI	5264
	$C_2H_5CH(CH_3)CH_2CHO$	15877-57-3	2- C_4H_8	10.88	EI	4729
			C_4H_8	11.40	EI	5264
	<i>n</i> - $C_5H_{11}CHO$	66-25-1	C_4H_8	11.60	EI	5264
	<i>n</i> - $C_6H_{13}OH$	111-27-3		~ 10.7	EI	4729
	$C_3H_6O_2$ (1,3-dioxolane)	646-06-0	CH_2O	10.87	EI	4729
$C_2H_3DO^+$	CH_3CDO	4122-13-8	**	10.21	PI	5270

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_2HD_3O^+$	CD ₃ CHO	19901-15-6	**	10.19	PI	5270
$C_2D_4O^+$	C ₂ D ₄ O (Oxirane- <i>d</i> ₄)	6552-57-4	**	10.571	PE	4868
$C_2H_5O^+$	CH ₃ OCH ₂	23653-97-6	**	6.94	EI	4915
	C ₂ H ₅ OH	64-17-5	H	10.75±0.03	EI	5467
			H	10.67	EI	4915
	(CH ₃) ₂ O	115-10-6	H	10.99	EI	4915
			H	10.70±0.13	EI	5503
			H	11.23±0.04	EI	5467
			H	11.55±0.15	EI	4071
	C ₂ H ₅ OCH ₃	540-67-0	CH ₃	10.47	EI	4915
			CH ₃	10.91±0.1	EI	4071
	<i>n</i> -C ₃ H ₇ OH	71-23-8	CH ₃	11.35±0.04	EI	5467
	<i>iso</i> -C ₃ H ₇ OH	67-63-0	CH ₃	10.40±0.03	PI	5512
			CH ₃	10.26	EI	4915
	(C ₂ H ₅) ₂ O	60-29-7	C ₂ H ₅	11.85	EI	4915
				11.83	EI	4603
	C ₂ H ₅ CH(OH)CH ₃	78-92-2	C ₂ H ₅	10.22	EI	4915
	CH ₃ CD ₂ OC ₂ H ₅	XXXXX-XX-X		11.71	EI	4603
	CH ₃ CH(OH)CH ₂ OH	57-55-6	CH ₂ OH	10.25	EI	4915
	CH ₃ OCH ₂ CH ₂ OH	109-86-4	CH ₂ OH	10.36	EI	4915
	CH ₃ OCH ₂ CH ₂ OCH ₃	110-71-4	CH ₃ OCH ₂	10.27	EI	4915
	C ₂ H ₅ ONO	79-24-3	NO	10.62±0.07	EI	5467
	((CH ₃) ₂ C(NO)OOCCH ₃) ₂	68777-98-0		12.75	EI	4809
	CH ₂ BrCH ₂ OH	540-51-2	Br	10.47±0.05	EI	5467
$C_2H_4DO^+$	CH ₃ CD ₂ OC ₂ H ₅	XXXXX-XX-X		11.91	EI	4603
$C_2H_3D_2O^+$	CH ₃ OCD ₃	13725-27-4	D	11.53±0.1	EI	4071
	CH ₃ CD ₂ OC ₂ H ₅	XXXXX-XX-X		13.1	EI	4603
$C_2H_2D_3O^+$	CH ₃ OCD ₃	13725-27-4	H	11.15±0.1	EI	4071
	C ₂ H ₅ OCD ₃	16995-14-5	CH ₃	10.41±0.06	EI	5503
			CH ₃	11.01±0.1	EI	4071
$C_2H_6O^+$	C ₂ H ₅ OH	64-17-5	**	10.59 (V)	PE	5514
			**	10.61 (V)	PE	4850
			**	10.62 (V)	PE	3941
			**	10.64 (V)	PE	4068
			**	10.64 (V)	PE	5249
			**	10.65±0.03 (V)	PE	4484
			**	10.65 (V)	PE	5088
	(CH ₃) ₂ O	115-10-6	**	9.8±0.1	PE	4990
			**	9.98 (V)	PE	4850
			**	10.0±0.2 (V)	PE	4774
			**	10.03 (V)	PE	4884
			**	10.04 (V)	PE	3656
			**	10.04 (V)	PE	3844
			**	10.052 (V)	PE	4527
			**	11.94 (V)	PE	5249
			**	10.12±0.2	EI	4071

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_2H_3D_3O^+$	CH_3OCD_3	13725-27-4	**	10.00 ± 0.1	EI	4071
C_3HO^+	$CH_3COC \equiv CH$	1423-60-5	CH_3	11.00 ± 0.10	PE	5289
$C_3H_2O^+$	$C_3H_2(=O)$ (2-Cyclopropen-1-one)	2961-80-0	**	9.47	PE	4270
			**	10.0 ± 0.3	EI	4689
$C_3H_3O^+$	$CH_2 = CHCOCH_3$ ($C_6H_{11}NO_2$) ₂	78-94-4 68777-99-1	CH_3	10.44 ± 0.05 13.25	EI EI	5445 4809
$C_3H_4O^+$	$CH_2 = CHCHO$	107-02-8	**	10.13	PE	3864
			**	10.15 (V)	PE	4195
	$CH \equiv CCH_2OH$	107-19-7	**	10.45 (V)	PE	4847
	$CH_3CH = C = O$	6004-44-0	**	8.95 (V)	PE	5610
	$C_3H_4(=O)$ (Cyclopropanone)	5009-27-8	**	9.1 ± 0.1	EI	4689
	$CH_2 = CHCHO$ (2-Propenal)	107-02-8	**	10.11	PE	5360
$C_3H_5O^+$	$C_2H_5COCH_3$	123-72-8		10.22	EI	4535
	$(C_2H_5)_2CO$	96-22-0		10.10	EI	4535
	$(C_6H_{11}NO_2)_2$	68777-99-1		10.75	EI	4809
$C_3H_6O^+$	$(CH_3)_2CO$	67-64-1	**	9.705	S	5006
			**	9.71	S	5273
			**	9.694 ± 0.006	PI	5412
			**	9.700 ± 0.001	PI	4306
			**	9.71 ± 0.03	PI	3765
			**	9.5 (V)	PE	4467
			**	9.68 (V)	PE	4850
			**	9.70 (V)	PE	4513
			**	9.709 ± 0.005	PE	5519
			**	9.709 (V)	PE	4527
			**	9.71 ± 0.01	PE	4535
			**	9.71 ± 0.02 (V)	PE	4524
			**	9.71	PE	4224
			**	9.71 (V)	PE	4233
			**	9.72	PE	3649
			**	9.72 (V)	PE	4285
			**	9.72 (V)	PE	5538
			**	9.75 ± 0.025	PE	3626
			**	9.71 ± 0.03	EI	4535
			**	9.74	EI	3485
	$CH_2 = CHCH_2OH$	107-18-6	**	9.63	PE	3864
			**	10.22 (V)	PE	3863
	$CH_2 = CHOCH_3$	107-25-5	**	8.95	PE	3863
			**	8.96	PE	4246
			**	9.05 (V)	PE	4291
	C_2H_5CHO	123-38-6	**	9.85 (V)	PE	4513
			**	9.953 ± 0.005	PE	5519
			**	9.96 (V)	PE	4850
			**	9.99	PE	4224
	C_3H_6O	503-30-0	**	9.63	PE	3980
	(Oxetane)			9.679 (V)	PE	4527

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₃H₆O⁺	C ₂ H ₅ OCH ₃ (Oxirane, methyl-)	75-56-9	**	10.26 (V)	PE	4747
	<i>n</i> -C ₃ H ₇ COCH ₃	107-87-9	C ₂ H ₄	10.08	EI	5039
	<i>n</i> -C ₄ H ₉ CHO	110-62-3	C ₂ H ₄	9.82	EI	5039
			C ₂ H ₄	10.00	EI	5264
	C ₅ H ₉ OH (Cyclopentanol)	96-41-3	C ₂ H ₄	9.98	EI	5039
	(CH ₃) ₂ CHC ₂ H ₄ CHO	1119-16-0	C ₃ H ₆	11.00	EI	5264
	C ₂ H ₅ CH(CH ₃)CH ₂ CHO	15877-57-3	C ₃ H ₆	10.10	EI	5264
	<i>n</i> -C ₅ H ₁₁ CHO	66-25-1	C ₃ H ₆	9.72	EI	5039
			C ₃ H ₆	10.20	EI	5264
	<i>n</i> -C ₃ H ₇ CH(CH ₃)CHO	123-15-9	C ₃ H ₆	9.80	EI	5039
	<i>n</i> -C ₄ H ₉ COCH ₃	591-78-6	C ₃ H ₆	10.04	EI	5039
	<i>sec</i> -C ₅ H ₁₁ CHO	123-15-9	C ₃ H ₆	10.30	EI	5264
	<i>iso</i> -C ₄ H ₉ COCH ₃	108-10-1	C ₃ H ₆	9.98	EI	5039
C₃D₆O⁺	(CD ₃) ₂ CO	666-52-4	**	9.695±0.006	PI	5412
			**	9.68	PE	3649
C₃H₇O⁺	CH ₃ CHOCH ₃	20615-69-4	**	<6.50	EI	4915
	C ₂ H ₅ OCH ₃	540-67-0	H	10.32	EI	4915
			H	10.32±0.1	EI	4071
	<i>n</i> -C ₃ H ₇ OH	71-23-8	H	10.2	EI	3916
			H	10.48±0.03	EI	3626
	<i>iso</i> -C ₃ H ₇ OH	67-63-0	H	10.3±0.5	PI	5512
			H	<10.48	EI	4915
	(C ₂ H ₅) ₂ O	60-29-7	CH ₃	10.26	EI	4915
	<i>iso</i> -C ₃ H ₇ OCH ₃	598-53-8	CH ₃	9.82	EI	4915
	<i>tert</i> -C ₄ H ₉ OH	75-65-0	CH ₃	9.86	EI	4915
				10.1±0.2	EI	4124
	<i>n</i> -C ₃ H ₇ (CH ₃)OH	71-23-8	CH ₃	10.18	EI	4915
	<i>tert</i> -C ₅ H ₁₁ OH	75-85-4	C ₂ H ₅	9.80	EI	4915
	C ₂ H ₅ OCH ₂ CH ₂ OH	110-80-5	CH ₂ OH	10.26	EI	4915
	CH ₃ OCH(CH ₃)CH ₂ OH	1589-47-5	CH ₂ OH	9.68	EI	4915
C₃H₄D₃O⁺	C ₂ H ₅ OCD ₃	16995-14-5	H	10.22±0.1	EI	4071
C₃H₈O⁺	C ₂ H ₅ OCH ₃	540-67-0	**	9.72 (V)	PE	5088
			**	9.62±0.1	EI	4071
	<i>n</i> -C ₃ H ₇ OH	71-23-8	**	10.15±0.025	PE	3626
			**	10.49 (V)	PE	4068
			**	10.51 (V)	PE	3941
			**	10.51 (V)	PE	4850
			**	10.52±0.03 (V)	PE	4484
			**	10.0	EI	3916
			**	10.16±0.03	EI	3626
		67-63-0	**	10.10±0.02	PI	5512
			**	10.36 (V)	PE	4068
			**	10.42 (V)	PE	3941
			**	10.44 (V)	PE	4850
			**	10.49±0.03 (V)	PE	4484
C₃H₅D₃O⁺	C ₂ H ₅ OCD ₃	16995-14-5	**	9.64±0.1	EI	4071
C₄H₄O⁺	CH ₃ COC≡CH	1423-60-5	**	10.19	PE	5289

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₃H₄O⁺	C ₃ H(=O)CH ₃ (Cyclopropenone, methyl-)	XXXXX-XX-X	**	9.15±0.05	PE	5086
	C ₄ H ₄ O (Furan)	110-00-9	**	8.91±0.01	PI	4058
			**	8.88	PE	5289
			**	~8.8	EI	4656
			**	8.85±0.05	EI	4316
			**	8.99±0.05	EI	3482
			**	8.89	CTS	4382
C₄H₅O⁺	C ₅ H ₈ NCOCH=CHCH ₃ (Pyridine, 1,2,3,4-tetrahydro-1-(1-oxo-2-butenyl)-, (E))	50838-23-8		13.0	EI	4046
	C ₅ H ₁₀ NCOCH=CHCH ₃ (Piperidine, 1-(1-oxo-2-butenyl)-, (E))	50838-22-7	**	14.6	EI	4046
C₄H₆O⁺	CH ₂ =CHCOCH ₃	78-94-4	**	9.61 (V)	PE	4224
			**	9.67 (V)	PE	4285
			**	10.11 (V)	PE	5538
			**	9.66	PE	5360
	(CH ₃) ₂ C=C=O	598-26-5	**	8.38 (V)	PE	5610
	CH≡CCH(CH ₃)OH	2028-63-9	**	10.41 (V)	PE	4847
	CH ₃ CH=CHCHO	4170-30-3	**	9.86±0.03 (V)	PE	4767
			**	9.75	PE	5360
	CH ₂ =C=CHOCH ₃	13169-00-1	**	8.75 (V)	PE	4748
	C ₄ H ₆ O (Cyclobutanone)	1191-95-3	**	9.61±0.02 (V)	PE	3517
			**	9.4±0.1	EI	4689
			**	9.58±0.1	EI	3794
	C ₄ H ₆ O (Furan, 2,5-dihydro-)	1708-29-8	**	9.14±0.02 (V)	PE	3843
			**	9.16	PE	4688
			**	9.16 (V)	PE	4290
	C ₂ H ₃ OCH=CH ₂ (Oxirane, ethenyl-)	930-22-3	**	9.94 (V)	PE	4747
	CH ₂ =C(CH ₃)CHO (2-Propenal, 2-methyl-)	78-85-3	**	9.92	PE	5360
C₄H₇O⁺	<i>iso</i> -C ₃ H ₇ COCH ₃	563-80-4		9.9	EI	4535
	<i>(iso</i> -C ₃ H ₇) ₂ CO	565-80-0		9.56	EI	4535
C₄H₈O⁺	CH ₂ =CHCH ₂ (OCH ₃)	627-40-7	**	9.84±0.05 (V)	PE	4954
	C ₂ H ₅ COCH ₃	78-93-3	**	9.54±0.03	PI	3765
			**	9.49 (V)	PE	4850
			**	9.52	PE	4224
			**	9.529±0.005	PE	5519
			**	9.53±0.01	PE	4535
			**	9.56 (V)	PE	4513
			**	9.54±0.03	EI	4535
	CH ₂ =CHCH(OH)CH ₃ <i>n</i> -C ₃ H ₇ CHO	598-32-3	**	10.05 (V)	PE	5460
		123-72-8	**	9.83 (V)	PE	4513
			**	9.836±0.005	PE	5519
			**	9.85 (V)	PE	4850
	<i>sec</i> -C ₃ H ₇ CHO	78-84-2	**	9.82 (V)	PE	4224
			**	9.705±0.005	PE	5519
	C ₄ H ₈ O (Furan, tetrahydro-)	109-99-9	**	9.41	S	3749
			**	9.38	PE	4573

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₄H₈O⁺	C ₄ H ₈ O	109-99-9	**	9.53 (V)	PE	4145
			**	9.57±0.02 (V)	PE	3843
			**	9.65 (V)	PE	4290
			**	9.71 (V)	PE	4742
	C ₂ H ₂ O(CH ₃) ₂ (Oxirane, 2,2-dimethyl-)	558-30-5	**	10.00 (V)	PE	4747
	C ₂ H ₂ O(CH ₃) ₂ (Oxirane, 2,3-dimethyl, <i>trans</i> -)	21490-63-1	**	9.98 (V)	PE	4747
	C ₂ H ₃ OC ₂ H ₅ (Oxirane, ethyl-)	106-88-7	**	10.15 (V)	PE	4747
	(C ₂ H ₃) ₂ CHCHO	97-96-1	C ₂ H ₄	9.68	EI	5039
	(CH ₃) ₂ CHC ₂ H ₄ CHO	1119-16-0	C ₂ H ₄	10.10	EI	5264
	C ₂ H ₅ C(CH ₃) ₂ CHO	2094-75-9	C ₂ H ₄	9.58	EI	5039
	C ₂ H ₅ CH(CH ₃)CH ₂ CHO	15877-57-3	C ₂ H ₄	11.00	EI	5264
	<i>n</i> -C ₅ H ₁₁ CHO	66-25-1	C ₂ H ₄	10.00	EI	5264
	<i>n</i> -C ₃ H ₇ COC ₂ H ₅	589-38-8	C ₂ H ₄	9.89	EI	5039
	<i>sec</i> -C ₅ H ₁₁ CHO	123-15-9	C ₂ H ₄	10.60	EI	5264
	<i>sec</i> -C ₆ H ₉ COCH ₃	565-61-7	C ₂ H ₄	9.52	EI	5039
	<i>n</i> -C ₄ H ₉ COC ₂ H ₅	106-35-4	C ₃ H ₆	9.82	EI	5039
	<i>n</i> -C ₃ H ₇ CH(CH ₃)COCH ₃	2550-21-2	C ₃ H ₆	9.41	EI	5039
	<i>iso</i> -C ₃ H ₇ CH(C ₂ H ₅)CHO	26254-92-2	C ₃ H ₆	9.68	EI	5039
C₄H₉O⁺	<i>iso</i> -C ₃ H ₇ OC ₂ H ₅	625-54-7	CH ₃	9.50	EI	4915
	<i>tert</i> -C ₅ H ₁₁ OH	75-85-4	CH ₃	9.89	EI	4915
	<i>tert</i> -C ₄ H ₉ OCH ₃	1634-04-4	CH ₃	9.46	EI	4915
C₄H₁₀O⁺	(C ₂ H ₅) ₂ O	60-29-7	**	9.41	PE	4573
			**	9.59 (V)	PE	4850
			**	9.701 (V)	PE	4527
	<i>n</i> -C ₄ H ₉ OH	71-36-3	**	10.37 (V)	PE	4068
			**	10.43 (V)	PE	4850
			**	10.44±0.03 (V)	PE	4484
	<i>sec</i> -C ₄ H ₉ OH	78-92-2	**	10.23 (V)	PE	4850
			**	10.35±0.03 (V)	PE	4484
			**	10.47±0.03 (V)	PE	4484
	<i>iso</i> -C ₄ H ₉ OH	78-83-1	**	10.25±0.03 (V)	PE	4484
	<i>tert</i> -C ₄ H ₉ OH	75-65-0	**	10.25 (V)	PE	3941
			**	10.26 (V)	PE	4850
			**	10.26 (V)	PE	4850
C₅H₄O⁺	C ₅ H ₄ O (2,4-Cyclopentadien-1-one)	13177-38-3	**	9.49 (V)	PE	4616
	C ₆ H ₄ O ₂ (2,5-Cyclohexadiene-1,4-dione)	106-51-4	CO	11.10±0.05	PI	3523
C₅H₆O⁺	C ₄ H ₃ OCH ₃ (Furan,2-methyl-)	534-22-5	**	8.54 (V)	PE	5323
	C ₄ H ₃ O(CH ₃) (Furan,3-methyl-)	930-27-8	**	8.37±0.05 (V)	PE	4626
			**	8.70 (V)	PE	5323
			**	8.58	CTS	4382
	C ₅ H ₆ (=O) (2-Cyclopenten-1-one)	930-30-3	**	9.30 (V)	PE	4195
	C ₅ H ₆ O (4H-Pyran)	289-65-6	**	9.35 (V)	PE	4285
			**	8.47±0.05	EI	3482
			**	8.38±0.02 (V)	PE	4740

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₅H₈O⁺	C ₅ H ₇ (OH) (2-Cyclopenten-1-ol)	3212-60-0	**	9.60±0.05 (V)	PE	4954
	CH≡CC(CH ₃) ₂ OH	115-19-5	**	10.18 (V)	PE	4847
	CH≡CCH ₂ CH(OH)CH ₃	2117-11-5	**	10.24 (V)	PE	4847
	CH ₂ =C(OCH ₃)CH=CH ₂	3588-30-5	**	8.43	PE	3892
	<i>trans</i> -CH ₃ OCH=CHCH=CH ₂	10034-09-0	**	8.03	PE	3892
	CH ₃ CH=C(CH ₃)CHO (2-Butenal,2-methyl-(E)-)	497-03-0	**	9.60	PE	5360
	CH ₃ CH=C(CH ₃)CHO (2-Butenal,2-methyl-(Z)-)	6038-09-1	**	9.59	PE	5360
	CH ₂ =C(CH ₃)C(=O)CH ₃	814-78-8	**	9.50	PE	5360
	C ₅ H ₈ O (Cyclopentanone)	120-92-3	**	9.42±0.03	PI	3765
			**	9.10 (V)	PE	5043
			**	9.25±0.02 (V)	PE	3517
			**	9.28 (V)	PE	4285
			**	9.28 (V)	PE	4742
	C ₃ H ₅ COCH ₃ (Ethanone,1-cyclopropyl-)	765-43-5	**	9.46 (V)	PE	5528
			**	9.50 (V)	PE	4233
	CH ₃ CH ₂ CH=CHCHO (2-Pentenal)	764-39-6	**	9.70	PE	5360
	C ₂ H ₅ COCH=CH ₂ (1-Penten-3-one)	1629-58-9	**	9.50	PE	5360
	CH ₃ CH=CHC(=O)CH ₃ (3-Penten-2-one)	625-33-2	**	9.39	PE	5360
	C ₅ H ₈ O (2 <i>H</i> -Pyran, 3,4-dihydro-)	110-87-2	**	8.35	PE	4246
			**	8.37±0.02	PE	4740
			**	8.60 (V)	PE	4569
C₅H₉O⁺	<i>n</i> -C ₄ H ₉ COCH ₃	591-78-6	CH ₃	9.4	EI	3916
	<i>tert</i> -C ₄ H ₉ COCD ₃	XXXXX-XX-X	CD ₃	9.80	EI	4535
	(tert-C ₄ H ₉) ₂ CO	815-24-7		~9.38	EI	4535
C₅H₁₀O⁺	CH ₂ =CHOCH(CH ₃) ₂ (C ₂ H ₅) ₂ CO	XXXXX-XX-X 96-22-0	**	8.90 (V)	PE	4569
			**	9.22±0.02	PE	4695
			**	9.309±0.005	PE	5519
			**	9.31±0.01	PE	4535
			**	9.37±0.03	EI	4535
	CH ₂ =CHC(CH ₃) ₂ OH	115-18-4	**	9.90 (V)	PE	5460
	CH ₃ CH=CHCH(OH)CH ₃	1569-50-2	**	9.56 (V)	PE	5460
	CH ₂ =C(CH ₃)CH(OH)CH ₃	10473-14-0	**	9.61 (V)	PE	5460
	<i>n</i> -C ₃ H ₇ COCH ₃	107-87-9	**	9.47±0.03	PI	3765
			**	9.28±0.02	PE	4695
			**	9.383±0.005	PE	5519
			**	9.44 (V)	PE	4850
	<i>n</i> -C ₄ H ₉ CHO	110-62-3	**	9.65±0.02	PE	4695
			**	9.748±0.005	PE	5519
			**	9.82 (V)	PE	4850
			**	9.72±0.06	EI	5267
			**	9.90	EI	5264
	<i>sec</i> -C ₄ H ₉ CHO	96-17-3	**	9.59±0.01	PE	5519
	<i>iso</i> -C ₃ H ₇ COCH ₃	563-80-4	**	9.298±0.005	PE	5519
			**	9.30±0.01	PE	4535
			**	9.36	PE	4224
			**	9.30±0.04	EI	4535
	<i>iso</i> -C ₄ H ₉ CHO	590-86-3	**	9.697±0.005	PE	5519

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_5H_{10}O^+$	<i>tert</i> -C ₄ H ₉ CHO	630-19-3	**	9.50±0.01	PE	5519
	C ₅ H ₉ OH (Cyclopentanol)	96-41-3	**	9.58±0.06	EI	5267
	C ₅ H ₁₀ O (2H-Pyran, tetrahydro-)	142-68-7	**	9.16	PE	4573
			**	9.46 (V)	PE	4246
			**	9.48 (V)	PE	4082
			**	9.50 (V)	PE	3733
$C_5H_{11}O^+$	<i>tert</i> -C ₄ H ₉ OC ₂ H ₅	637-92-3	CH ₃	9.24	EI	4915
$C_5H_{12}O^+$	<i>n</i> -C ₅ H ₁₁ OH	71-41-0	**	10.42±0.03 (V)	PE	4484
	<i>tert</i> -C ₅ H ₁₁ OH	75-85-4	**	10.16±0.03 (V)	PE	4484
	<i>tert</i> -C ₄ H ₉ OCH ₃	1634-04-4	**	9.41 (V)	PE	4850
$C_6H_4O^+$	C ₆ H ₄ O (Methanone, 2,4-cyclopentadien-1-ylidene-)	4727-22-4	**	8.95±0.1	EI	3552
			**	8.99±0.1	EI	3553
			**	9.05±0.05	EI	4317
	C ₆ H ₄ O (3-Oxabicyclo[3.2.0]hepta-1,4,6-triene)	40020-12-0	**	8.05 (V)	PE	4779
	<i>cis</i> -C ₂ H ₂ O(C≡CH) ₂ (Oxirane, <i>cis</i> -2,3-diethynyl-)	40020-13-1	**	9.60	PE	4374
	<i>trans</i> -C ₂ H ₂ O(C≡CH) ₂ (Oxirane, <i>trans</i> -2,3-diethynyl-)	40020-14-2	**	9.50	PE	4374
	C ₆ H ₄ (O)NN (2,4-Cyclohexadien-1-one, 6-diazo-)	4024-72-0	**	8.29±0.05	EI	4317
	C ₆ H ₄ (O)NN (2,5-Cyclohexadien-1-one, 4-diazo-)	932-97-8	N ₂	9.6±0.01	EI	4317
$C_6H_5O^+$	C ₆ H ₅ OCH ₃ (Benzene, methoxy-)	100-66-3	CH ₃	11.3	EI	3916
			CH ₃	11.80±0.1	EI	3446
	C ₆ H ₄ (OH)COOH (Benzoic acid, 3-hydroxy-)	99-06-9	CO + OH	14.42±0.2	EI	3973
	C ₆ H ₄ (OH)COOH (Benzoic acid, 4-hydroxy-)	99-96-7	CO + OH	14.56±0.2	EI	3973
	C ₆ H ₅ NO ₂ (Benzene, nitro-)	98-95-3	NO	10.95±0.05	PI	5437
			NO	10.35±0.1	EI	3447
	C ₆ H ₄ (NO ₂)OH (Phenol, 4-nitro-)	100-02-7	NO ₂	11.91±0.1	EI	3447
$C_6H_6O^+$	C ₆ H ₅ OH (Phenol)	108-95-2	**	8.37	PE	3955
			**	8.47±0.02	PE	3890
			**	8.55	PE	4621
			**	8.56 (V)	PE	4891
			**	8.67 (V)	PE	4327
			**	8.69 (V)	PE	4884
			**	8.73	PE	5272
			**	8.50	EI	3845
			**	8.69	EI	3485
			**	9.09±0.1	EI	3817
	C ₆ H ₅ OC ₂ H ₅ (Benzene, ethoxy-)	103-73-1	C ₂ H ₄	10.03±0.19	EI	5611

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₆H₆O⁺	C ₆ H ₅ OC ₂ H ₅	103-73-1	C ₂ H ₄	11.3	EI	3479
	C ₇ H ₆ O ₂ (2,4,6-Cycloheptatrien-1-one, 2-hydroxy-)	533-75-5	CO	10.8	EI	3479
	C ₆ H ₄ (OH)OCH ₃ (Phenol, 4-methoxy-)	150-76-5	HCHO	10.30	EI	3845
	C ₆ H ₅ OOCCCH ₃ (Acetic acid, phenyl ester)	122-79-2	CH ₂ =C=O	9.57±0.03	EI	3483
	C ₆ H ₅ OCH ₂ CH ₂ F (Benzene,2-fluoroethoxy-)	405-97-0	CH ₂ =C=O C ₂ H ₃ F	9.89±0.2 11.18	EI EI	3484 5083
	C ₆ H ₅ OCH ₂ CH ₂ Cl (Benzene,2-chloroethoxy-)	622-86-6	C ₂ H ₃ Cl	10.80	EI	5083
	C ₆ H ₅ OCH ₂ CH ₂ Br (Benzene,2-bromoethoxy-)	589-10-6	C ₂ H ₃ Br	9.71	EI	5083
	CH ₃ (CH=CH) ₂ CHO	142-83-6	**	9.22±0.03 (V)	PE	4767
		930-68-7	**	9.20 (V)	PE	4195
C₆H₈O⁺						
	C ₆ H ₈ O (2-Cyclohexen-1-one)		**	9.23±0.05	PE	5086
				9.37 (V)	PE	4285
	C ₆ H ₈ O (3-Cyclohexen-1-one)	4096-34-8	**	9.42 (V)	PE	4285
				8.45±0.05	EI	3482
	C ₄ H ₃ OC ₂ H ₅ (Furan, 2-ethyl-)	3208-16-0	**			
	C ₆ H ₈ O (7-Oxabicyclo[2.2.1]hept-2-ene)	6705-50-6	**	9.44±0.02 (V)	PE	3843
	C ₅ H ₇ (OCH ₃) (Cyclopentene, 3-methoxy-)	39819-74-4	**	9.45±0.05 (V)	PE	4954
	C ₅ H ₇ (OCH ₃) (Cyclopentene, 4-methoxy-)	40955-64-4	**	9.12±0.03 (V)	PE	4468
C₆H₁₀O⁺	C ₅ H ₇ O(CH ₃) (2H-Pyran, 3,4-dihydro-6-methyl-)	16015-11-5	**	8.40 (V)	PE	4569
	<i>n</i> -C ₃ H ₇ CH=CHCHO	505-57-7	**	9.65	PE	5360
		77-75-8	**	10.03 (V)	PE	4847
	CH ₂ =CHCH ₂ CH ₂ COCH ₃	109-49-9	**	9.50 (V)	PE	4195
		24264-08-2	**	8.24	EI	4660
	CH ₃ CH=C(C ₂ H ₅)CHO (2-Butenal,2-ethyl-)	19780-25-7	**	9.53	PE	5360
		108-94-1	**	9.14±0.03	PI	3765
	C ₆ H ₁₀ O (Cyclohexanone)		**	9.14±0.02 (V)	PE	3517
				9.18	PE	5085
				9.18 (V)	PE	5043
				9.28 (V)	PE	4285
				9.5±0.2	EI	4074
				9.3 (V)	PE	5528
	C ₃ H ₄ (CH ₃)COCH ₃ (Ethanone,1-(1-methylcyclopropyl)-)	1567-75-5	**	9.38 (V)	PE	5528
	C ₃ H ₄ (CH ₃)COCH ₃ (Ethanone,1-(2-methylcyclopropyl)-)	930-56-3	**			
	CH ₃ CH=CHC(=O)C ₂ H ₅	2497-21-4	**	9.32	PE	5360
		279-49-2	**	9.57±0.02 (V)	PE	3843
	C ₆ H ₁₀ O (7-Oxabicyclo[2.2.1]heptane)	623-36-9	**	9.54	PE	5360
	<i>iso</i> -C ₃ H ₇ COCH=CH ₂	1606-47-9	**	9.39	PE	5360
		565-62-8	**	9.35	PE	5360
	(CH ₃) ₂ C=CHC(=O)CH ₃	141-79-7	**	9.11	PE	5360
		42282-85-9		9.60	EI	4660
	C ₃ HN(=O) ₂ (C ₂ H ₅) ₂ (2,4-Azetidinedione, 3,3-diethyl-)					

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_6H_{10}O^+$	$C_3N(=O)_2(C_2H_5)_2C_6H_5$ (2,4-Azetidinedione, 3,3-diethyl-1-phenyl-)	15745-94-5		9.61	EI	4660
$C_6H_{11}O^+$	$(C_6H_{11}NO_2)_2$	68777-99-1		9.65	EI	4809
$C_6H_{12}O^+$	$C_5H_9(OCH_3)$ (Cyclopentane, methoxy-) <i>tert</i> - $C_4H_9COCH_3$	5614-37-9	**	9.40 ± 0.03 (V)	PE	4468
		75-97-8	**	8.88 ± 0.04	PE	3851
			**	9.11 ± 0.01	PE	4535
			**	9.117 ± 0.005	PE	5519
			**	9.21 (V)	PE	4224
			**	9.17 ± 0.06	EI	4535
			**	9.24	PE	4395
			**	9.18 ± 0.03	PI	3765
	$(CH_3)_2CHC_2H_4CHO$	1119-16-0	**	9.80	EI	5264
	$C_2H_5CH(CH_3)CH_2CHO$	15877-57-3	**	9.90	EI	5264
	<i>n</i> - $C_5H_{11}CHO$	66-25-1	**	9.62 ± 0.02	PE	4695
			**	9.722 ± 0.005	PE	5519
			**	9.80	EI	5264
	<i>n</i> - $C_3H_7COC_2H_5$	589-38-8	**	9.12 ± 0.02	PE	4695
	<i>n</i> - $C_4H_9COCH_3$	591-78-6	**	9.44 ± 0.03	PI	3765
			**	9.24 ± 0.02	PE	4695
			**	9.331 ± 0.005	PE	5519
			**	9.38 (V)	PE	4850
			**	9.2	EI	3916
	<i>iso</i> - $C_4H_9COCH_3$	108-10-1	**	9.42	PE	4224
			**	9.296 ± 0.005	PE	5519
	<i>sec</i> - $C_6H_{11}CHO$	123-15-9	**	9.70	EI	5264
	<i>sec</i> - $C_4H_9COCH_3$	565-61-7	**	9.209 ± 0.005	PE	5519
	<i>iso</i> - $C_3H_7COC_2H_5$	565-69-5	**	9.098 ± 0.005	PE	5519
	<i>neo</i> - $C_5H_{11}CHO$	2987-16-8	**	9.610 ± 0.005	PE	5519
	$C_6H_{11}OH$ (Cyclohexanol)	108-93-0	**	10.0 ± 0.2	EI	4617
$C_6H_{14}O^+$	<i>tert</i> - $C_4H_9OC_2H_5$	637-92-3	**	9.39 ± 0.015 (V)	PE	4434
	$(n-C_3H_7)_2O$	111-43-3	**	9.49 (V)	PE	4850
$C_7H_5O^+$	C_6H_5CHO (Benzaldehyde)	100-52-7	H	11.26	EI	3792
	$C_6H_5COCH_3$ (Acetophenone)	98-86-2	CH_3	10.50 ± 0.01	EI	5059
			CH_3	9.6	EI	3916
			CH_3	10.38	EI	3792
	$(C_6H_5)_2CO$ (Methanone, diphenyl-)	119-61-9		11.35 ± 0.1	EI	4335
			C_6H_5	11.72	EI	3792
			C_6H_5	12.00 ± 0.1	EI	5493
	C_6H_5COOH (Benzoic acid)	65-85-0	OH	11.5 ± 0.07	EI	5121
			OH	12.11 ± 0.2	EI	3973
			OH	12.11	EI	3792
	$C_6H_5COOCH_3$ (Benzoic acid, methyl ester)	93-58-3	OCH_3	10.8 ± 0.05	EI	5121
			OCH_3	11.40	EI	3792
	$C_6H_5COOC_2H_5$ (Benzoic acid, ethyl ester)	93-89-0	OC_2H_5	10.8 ± 0.07	EI	5121
	$C_6H_5COOC_3H_7$ (Benzoic acid, 1-methylethyl ester)	939-48-0	OC_3H_7	11.2 ± 0.10	EI	5121

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_7H_5O^+$	$C_6H_5COOC_3H_7$ (Benzoic acid, propyl ester)	2315-68-6	OC_3H_7	11.2 ± 0.05	EI	5121
	$C_6H_5COC_4H_9O$ (Methanone, 2-furanylphenyl-)	2689-59-0	C_4H_9O	12.3 ± 0.1	EI	5493
	$C_6H_5COOC_4H_9$ (Benzoic acid, butyl ester)	136-60-7	OC_4H_9	11.2 ± 0.10	EI	5121
	$C_6H_5COOC_4H_9$ (Benzoic acid, 2-methylpropyl ester)	120-50-3	OC_4H_9	11.3 ± 0.10	EI	5121
	$C_6H_5COOC_5H_{11}$ (Benzoic acid, methylbutyl ester)	XXXXX-XX-X	OC_5H_{11}	11.2 ± 0.10	EI	5121
	$C_6H_5COOC_6H_5$ (Benzoic acid, phenyl ester)	93-99-2		10.0	EI	5631
	$C_6H_5COOC_6H_4OCH_3$ (Phenol, 4-methoxy-, benzoate)	1523-19-9		10.6	EI	5631
	$C_6H_5CONH_2$ (Benzamide)	55-21-0	NH_2	11.09	EI	3792
	$C_6H_5COC_5H_4N$ (Methanone, phenyl-2-pyridinyl-)	91-02-1	C_5H_4N	11.7 ± 0.1	EI	5493
	$C_6H_5COC_5H_4N$ (Methanone, phenyl-3-pyridinyl-)	5424-19-1	C_5H_4N	11.7 ± 0.1	EI	5493
	$C_6H_5COC_5H_4N$ (Methanone, phenyl-4-pyridinyl-)	14548-46-0	C_5H_4N	10.8 ± 0.1	EI	5493
	$C_6H_5COC_4H_3NCH_3$ (Methanone, (1-methyl-1H-pyrrol-2-yl)phenyl-)	37496-06-3		13.1 ± 0.1	EI	5493
	$C_5H_9NCOC_6H_5$ (Pyridine, 1-benzoyl-1,2,3,4-tetrahydro-)	50838-24-9		12.4	EI	4046
	$C_5H_{10}NCOC_6H_5$ (Piperidine, 1-benzoyl-)	776-75-0		14.4	EI	4046
	$C_6H_5COC_6H_4NH_2$ (Methanone, (2-aminophenyl)phenyl-)	2835-77-0		12.6 ± 0.2	EI	4358
	$C_6H_5COC_6H_4NH_2$ (Methanone, (3-aminophenyl)phenyl-)	2835-78-1		12.3 ± 0.2	EI	4358
	$C_6H_5COC_6H_4NH_2$ (Methanone, (4-aminophenyl)phenyl-)	1137-41-3		12.5 ± 0.2	EI	4358
	$C_6H_5COC_4H_3N_2$ (Methanone, phenylpyrazinyl-)	3430-09-9	$C_4H_3N_2$	10.8 ± 0.1	EI	5493
	$C_6H_5COC_4H_3N_2$ (Methanone, phenyl-4-pyrimidinyl-)	68027-80-5	$C_4H_3N_2$	10.7 ± 0.1	EI	5493
	$C_6H_5COC_6H_4NO_2$ (Methanone, (2-nitrophenyl)phenyl-)	2243-79-0		11.05 ± 0.1	EI	4358
	$C_6H_5COC_6H_4NO_2$ (Methanone, (3-nitrophenyl)phenyl-)	2243-80-3		11.15 ± 0.1	EI	4358
	$C_6H_5COC_6H_4NO_2$ (Methanone, (4-nitrophenyl)phenyl-)	1144-74-7		11.4 ± 0.1	EI	4358
	$C_6H_5COOC_6H_4NO_2$ (Benzoic acid, 4-nitrophenyl ester)	959-22-8		10.2	EI	5631
	$C_6H_5COC_6H_4S$ (Methanone, phenyl-2-thienyl-)	135-00-2	C_4H_3S	12.0 ± 0.1	EI	5493
	C_6H_5COCl (Benzoyl chloride)	98-88-4	Cl	10.31	EI	3792
	$C_6H_5COC_6H_4Cl$ (Methanone, (2-chlorophenyl)phenyl-)	5162-03-8		11.1 ± 0.1	EI	4358
	$C_6H_5COC_6H_4Cl$ (Methanone, (3-chlorophenyl)phenyl-)	1016-78-0		11.3 ± 0.1	EI	4358
	$C_6H_5COC_6H_4Cl$ (Methanone, (4-chlorophenyl)phenyl-)	134-85-0		11.5 ± 0.1	EI	4358
$C_7H_6O^+$	C_6H_5CHO (Benzaldehyde)	100-52-7	**	9.50 ± 0.02	PI	4031
			**	9.50 ± 0.02	PI	4057

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_7H_6O^+$	C_6H_5CHO	100-52-7	**	9.6	PI	3586
			**	9.40	PE	3938
			**	9.49	PE	4621
			**	9.54 (V)	PE	4850
			**	10.0 (V)	PE	4467
			**	9.74	EI	3792
	C_7H_6O (2,4,6-Cycloheptatriene-1-one)	539-80-0	**	8.89 ± 0.03 (V)	PE	4391
			**	8.82 (V)	PE	5444
			**	8.90 ± 0.02 (V)	PE	4140
	$C_6H_4(=O)(=CH_2)$ (2,4-Cyclohexadien-1-one, 6-methylene-)	27890-67-1	**	8.80 (V)	PE	4744
$C_7H_7O^+$	$C_6H_5CH_2C_6H_4OH$ (Phenol, 4-(phenylmethyl)-)	101-53-1	C_6H_5	11.1 ± 0.2	EI	3807
	$C_6H_4(OCH_3)CH_3$ (Benzene, 1-methoxy-3-methyl-)	100-84-5	CH_3	11.60 ± 0.1	EI	3446
	$C_6H_4(OCH_3)CH_3$ (Benzene, 1-methoxy-4-methyl-)	104-93-8	CH_3	11.45 ± 0.1	EI	3446
	$C_6H_4(OH)C_4H_9$ (Phenol, 3-butyl-)	4074-43-5		12.79 ± 0.1	EI	3629
	$C_6H_4(OH)C_4H_9$ (Phenol, 4-butyl-)	1638-22-8		11.45 ± 0.1	EI	3629
	$C_6H_4(CH_3)OOCCH_3$ (Acetic acid, 2-methylphenyl ester)	533-18-6	CH_3CO	13.16 ± 0.02	EI	3631
	$C_6H_4(CH_3)OOCCH_3$ (Acetic acid, 4-methylphenyl ester)	140-39-6	CH_3CO	13.47 ± 0.02	EI	3631
	$C_6H_4(OCH_3)COOH$ (Benzoic acid, 3-methoxy-)	586-38-9	COOH	13.07 ± 0.2	EI	3973
	$C_6H_4(OCH_3)COOH$ (Benzoic acid, 4-methoxy-)	100-09-4	COOH	12.80 ± 0.2	EI	3973
	$C_6H_4(NO_2)CH_3$ (Benzene, 1-methyl-3-nitro-)	99-08-1	NO	9.98 ± 0.1	EI	3447
	$CH_3C_6H_4NO_2$ (Benzene, 1-methyl-4-nitro-)	99-99-0	NO	10.91 ± 0.05	PI	5437
	$C_6H_4(NO_2)OCH_3$ (Benzene, 1-methoxy-3-nitro-)	555-03-3	NO	10.34 ± 0.1	EI	3447
			NO_2	11.44 ± 0.1	EI	3447
	$C_6H_4(NO_2)OCH_3$ (Benzene, 1-methoxy-4-nitro-)	100-17-4	NO_2	11.63 ± 0.1	EI	3447
$C_7H_8O^+$	$C_6H_4CH_3(OH)$ (Phenol, 2-methyl-)	95-48-7	**	8.48 (V)	PE	5272
			**	8.50 (V)	PE	4891
			**	8.24 ± 0.02	PE	3890
			**	8.52 (V)	PE	5272
	$C_6H_4CH_3(OH)$ (Phenol, 3-methyl-)	108-39-4	**	8.41 (V)	PE	4891
			**	8.38 (V)	PE	5272
			**	8.35 (V)	PE	4891
			**	8.34	EI	4089
	$C_6H_5CH_2OH$ (Benzenemethanol)	100-51-6	**	9.11 (V)	PE	4850
			**	9.23 (V)	PE	4744
			**	9.00 ± 0.1	EI	3788
			**	8.20 ± 0.02	PE	3890
	$C_6H_5OCH_3$ (Benzene, methoxy-)	100-66-3	**	8.24	PE	4621

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_7H_8O^+$	$C_6H_5OCH_3$	100-66-3	**	8.25 (V)	PE	4850
			**	8.39 (V)	PE	5272
			**	8.42 (V)	PE	3781
			**	8.42 (V)	PE	4884
			**	8.45 (V)	PE	5310
			**	8.46 (V)	PE	4327
			**	8.20	EI	3845
			**	8.20	EI	3845
			**	8.25 ± 0.1	EI	3788
			**	8.39 ± 0.1	EI	3446
			**	8.6	EI	3479
			**	8.6	EI	3916
			**	8.76 ± 0.1	EI	3735
			**	8.18	CTS	3758
			**	8.37	CTS	4029
	C_7H_8O (Bicyclo[2.2.1]hept-2-en-7-one)	694-71-3	**	9.25 (V)	PE	4285
	C_7H_8O (Bicyclo[2.2.1]hept-5-en-2-one)	694-98-4	**	8.86 (V)	PE	4285
	C_7H_8O (2-Oxabicyclo[3.2.1]octa-3,6-diene)	4729-06-0	**	8.04-8.24 (V)	PE	5481
	$C_6H_4(OH)C_4H_9$ (Phenol, 3-butyl-)	4074-43-5	$CH_2=CHCH_3$	11.07 ± 0.1	EI	3629
	$C_6H_4(OH)C_4H_9$ (Phenol, 4-butyl-)	1638-22-8	$CH_2=CHCH_3$	10.32 ± 0.1	EI	3629
	$C_6H_4(OCH_3)_2$ (Benzene, 1,3-dimethoxy-)	151-10-0	CH_2O	10.98 ± 0.1	EI	3446
	$C_6H_4(OCH_3)_2$ (Benzene, 1,4-dimethoxy-)	150-78-7	HCHO	11.00	EI	3845
	$C_6H_4(CH_3)OOCCH_3$ (Acetic acid, 2-methylphenyl ester)	533-18-6	$CH_2=C=O$	9.44 ± 0.02	EI	3631
	$C_6H_4(CH_3)OOCCH_3$ (Acetic acid, 3-methylphenyl ester)	122-46-3	$CH_2=C=O$	10.03 ± 0.2	EI	3484
	$C_6H_4(CH_3)OOCCH_3$ (Acetic acid, 4-methylphenyl ester)	140-39-6	$CH_2=C=O$	9.26 ± 0.02	EI	3631
	$C_6H_5OOCOCH_3$ (Carbonic acid, methyl phenyl ester)	13509-27-8	$CH_2=C=O$	9.75 ± 0.2	EI	3484
			CO_2	10.3	EI	3479
	$(C_6H_5CH_2OH)(CO)_3Cr$ (Chromium, [(1,2,3,4,5,6- η)-benzenemethanol]tricarboxyl-)	12116-45-9		9.40 ± 0.1	EI	3788
	$(C_6H_5OCH_3)(CO)_3Cr$ (Chromium, tricarboxyl[(1,2,3,4,5,6- η)-methoxybenzene]-)	12116-44-8		8.45 ± 0.1	EI	3788
$C_7H_{10}O^+$	$C_7H_9(OH)$ (Bicyclo[2.2.1]hept-2-en-7-ol- <i>syn</i> -)	13118-70-2	**	9.41 (V)	PE	4511
	$C_7H_9(OH)$ (Bicyclo[2.2.1]hept-2-en-7-ol- <i>anti</i> -)	694-70-2	**	9.19 (V)	PE	4511
	$C_7H_{10}O$ (Bicyclo[2.2.1]heptane-2-one)	497-38-1	**	9.14 (V)	PE	4285
	$C_7H_{10}O$ (Bicyclo[2.2.1]heptan-7-one)	10218-02-7	**	9.06 (V)	PE	4285
	$C_7H_{10}O$ (2-Cyclohepten-1-one)	1121-66-0	**	9.25 (V)	PE	4285
	$C_7H_{10}O$ (3-Cyclohepten-1-one)	1121-64-8	**	9.14 (V)	PE	4285
	$(C_3H_5)_2CO$ (Methanone, dicyclopropyl-)	1121-37-5	**	9.28 (V)	PE	4233
	$C_7H_{10}O$ (2-Oxabicyclo[3.2.1]oct-3-ene)	59171-38-9	**	8.01-8.18 (V)	PE	5481

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₇H₁₂O⁺	C ₆ H ₉ (OCH ₃) (Cyclohexene, 4-methoxy-)	15766-93-5	**	9.01±0.03 (V)	PE	4468
	C ₆ H ₉ O(CH ₃) (Cyclohexanone, 2-methyl-)	583-60-8	**	9.05	PE	5085
	C ₆ H ₉ O(CH ₃) (Cyclohexanone, 4-methyl-)	589-92-4	**	9.5±0.2	EI	4074
			**	9.16	PE	5085
	CH ₂ =C(CH ₃)CH ₂ CH ₂ COCH ₃	3240-09-3	**	9.40 (V)	PE	4195
	C ₇ H ₁₂ O (Cycloheptanone)	502-42-1	**	9.14 (V)	PE	4285
			**	9.17±0.02 (V)	PE	3517
C₇H₁₄O⁺	C ₆ H ₁₁ (OCH ₃) (Cyclohexane, methoxy-)	931-56-6	**	9.22±0.03 (V)	PE	4468
	C ₂ H ₅ C(CH ₃) ₂ COCH ₃	20669-04-9	**	9.019±0.005	PE	5519
	n-C ₄ H ₉ COCH ₂ CH ₃	106-35-4	**	9.02±0.02	PE	4695
	n-C ₅ H ₁₁ COCH ₃	110-43-0	**	9.18±0.02	PE	4695
			**	9.298±0.005	PE	5519
			**	9.36 (V)	PE	4850
	n-C ₆ H ₁₃ CHO	111-71-7	**	9.65±0.02	PE	4695
	(n-C ₃ H ₇) ₂ CO	123-19-3	**	9.12±0.03	PI	3765
			**	9.04±0.02	PE	4695
			**	9.10±0.01	PE	5519
	iso-C ₅ H ₁₁ COCH ₃	110-12-3	**	9.284±0.005	PE	5519
	(iso-C ₃ H ₇) ₂ CO	565-80-0	**	8.94±0.01	PE	4535
			**	8.947±0.005	PE	5519
			**	8.99±0.04	EI	4535
	neo-C ₅ H ₁₁ COCH ₃	590-50-1	**	9.226±0.005	PE	5519
C₈H₄O⁺	C ₆ H ₈ O(CH ₃) ₂ (Cyclohexanone, 4,4-dimethyl-)	4255-62-3	**	9.12	PE	5085
	C ₆ H ₅ CH=C=O C ₆ H ₆ O (Benzene, ethynoxy-)	3496-32-0	**	8.17 (V)	PE	5610
C₈H₆O⁺	C ₆ H ₄ C ₂ H ₂ O (Benzofuran)	4279-76-9		8.7	EI	5290
		271-89-6	**	8.37±0.015 (V)	PE	5522
	C ₈ H ₆ O (Phenol, 2-ethynyl-)	5101-44-0	**	8.8	EI	5290
	C ₉ H ₆ O ₂ (2H-1-Benzopyran-2-one)	91-64-5	CO	8.85±0.05	EI	4316
				8.5	EI	5290
	CH ₃ C ₆ H ₄ COCH ₃ (Ethanone, 1-(4-methylphenyl))	122-00-9	CH ₃	10.52±0.05	EI	5059
	C ₆ H ₄ (CH ₃)COOH (Benzoic acid, 3-methyl-)	99-04-7	OH	12.38±0.2	EI	3973
C₈H₈O⁺	C ₆ H ₄ (CH ₃)COOH (Benzoic acid, 4-methyl-)	99-94-5	OH	12.07±0.2	EI	3973
	C ₆ H ₅ COCOC ₆ H ₄ CH ₃ (Ethanedione, (4-methylphenyl)phenyl-)	2431-00-7	C ₆ H ₅ CO	9.84±0.10	EI	3823
	C ₇ H ₅ OCH ₃ 2,4,6-Cycloheptatriene-1-one, 2-methyl-	29639-50-0	**	8.61±0.03 (V)	PE	4391

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₈H₈O⁺						
	C ₆ H ₅ COCH ₃ (Benzaldehyde, methyl-)	1334-78-7	**	8.9 (V)	PE	4467
	C ₆ H ₅ CH ₂ CHO (Benzeneacetaldehyde)	122-78-1	**	8.80	PE	3938
	C ₈ H ₈ O (Benzofuran, 2,3-dihydro-)	496-16-2	**	8.02	PE	4573
	C ₆ H ₅ COCH ₃ (Ethanone, 1-phenyl-)	98-86-2	**	9.29±0.2	PI	4031
			**	9.29±0.2	PI	4057
			**	9.6	PI	3586
			**	9.1±0.1	PE	4401
			**	9.35 (V)	PE	4850
			**	9.37 (V)	PE	5272
			**	9.45 (V)	PE	4804
			**	9.1	EI	3916
			**	9.50	EI	3792
	C ₆ H ₄ O(=CH ₂) ₂ (7-Oxabicyclo[2.2.1]hept-2-ene,5,6-bis(methylene)-)	56582-02-6	**	8.87±0.03 (V)	PE	4665
	C ₈ H ₈ O (9-Oxabicyclo[4.2.1]nona-2,4,7-triene)	7140-63-8	**	8.56 (V)	PE	4688
	C ₆ H ₅ C ₂ H ₃ O (Oxirane, phenyl-)	96-09-3	**	9.04 (V)	PE	4927
			**	9.07 (V)	PE	4747
			**	9.23 (V)	PE	5364
	C ₁₀ H ₁₁ OH (1-Naphthalenol, 1,2,3,4-tetrahydro-)	529-33-9	C ₂ H ₄	10.42±0.03	EI	4960
C₈H₉O⁺						
	C ₆ H ₄ (OCH ₃)C ₄ H ₉ (Benzene, 1-butyl-3-methoxy-)	20893-43-0		12.04±0.1	EI	3629
	C ₆ H ₄ (OCH ₃)C ₄ H ₉ (Benzene, 1-butyl-4-methoxy-)	18272-84-9		10.79±0.1	EI	3629
	C ₆ H ₅ CH ₂ C ₆ H ₄ OCH ₃ (Benzene, 1-methoxy-4-(phenylmethyl)-)	834-14-0	C ₆ H ₅	11.9±0.1	EI	3807
	C ₁₆ H ₁₈ O (Benzene, 1-methoxy-4-(3-phenylpropyl)-)	40715-68-2		10.7±0.1	EI	4925
	C ₆ H ₄ (OCH ₃)CH ₂ CH ₂ OCOCH ₃ (Phenethyl alcohol, <i>m</i> -methoxy-, acetate)	33709-39-6		12.10	EI	3590
	C ₆ H ₄ (OCH ₃)CH ₂ CH ₂ OCOCH ₃ (Phenethyl alcohol, <i>p</i> -methoxy-, acetate)	22532-51-0		11.50	EI	3590
C₈H₆D₃O⁺						
	C ₁₇ H ₁₇ D ₃ O ₂ (Benzene, 1-methoxy-3-[3-(4-methoxy- <i>d</i> ₃ -phenyl)propyl]-)	67081-97-4		11.1±0.1	EI	4925
C₈H₁₀O⁺						
	CH ₃ (CH=CH) ₃ CHO	17609-31-3	**	8.42±0.03 (V)	PE	4767
	C ₆ H ₅ OC ₂ H ₅ (Benzene, ethoxy-)	103-73-1	**	8.36 (V)	PE	5310
			**	8.41 (V)	PE	4327
			**	8.6	EI	3479
	C ₆ H ₅ CH ₂ OCH ₃ (Benzene, (methoxymethyl)-)	538-86-3	**	9.07 (V)	PE	4927
			**	9.12 (V)	PE	3781
	C ₆ H ₄ (CH ₃)OCH ₃ (Benzene, 1-methoxy-2-methyl-)	578-58-5	**	7.90	PE	4573
			**	8.03±0.02	PE	3890
			**	8.24 (V)	PE	5272
			**	8.24 (V)	PE	5310
	C ₆ H ₄ (CH ₃)OCH ₃ (Benzene, 1-methoxy-3-methyl)	100-84-5	**	8.28 (V)	PE	5272

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₈H₁₀O⁺	C ₆ H ₄ (CH ₃)OCH ₃	100-84-5	**	8.35±0.1	EI	3446
	C ₆ H ₄ (OCH ₃)CH ₃ (Benzene, 1-methoxy-4-methyl-)	104-93-8	**	8.14±0.01 (V)	PE	4389
			**	8.16 (V)	PE	4327
			**	8.17 (V)	PE	4211
			**	8.18 (V)	PE	5272
			**	7.85	EI	3845
			**	8.33±0.1	EI	3446
			**	7.91	CTS	3758
	C ₈ H ₁₀ O (Bicyclo[2.2.2]oct-5-en-2-one)	2220-40-8	**	8.73 (V)	PE	4285
	C ₆ H ₆ O(=CH ₂) ₂ (7-Oxabicyclo[2.2.1]heptane,2,3-bis(methylene)-)	53011-95-3	**	8.79±0.03 (V)	PE	4665
	C ₈ H ₁₀ O (9-Oxabicyclo[4.2.1]nona-2,4-diene)	19740-75-1	**	8.55 (V)	PE	4688
	C ₆ H ₃ (CH ₃) ₂ OH (Phenol,2,4-dimethyl-)	105-67-9	**	8.18 (V)	PE	5272
	C ₆ H ₃ (CH ₃) ₂ OH (Phenol, 2,6-dimethyl-)	576-26-1	**	8.05±0.02	PE	3890
			**	8.26 (V)	PE	5272
			**	8.34 (V)	PE	4327
	C ₈ H ₁₀ O (Tricyclo[3.2.1.0 ^{2,4}]octan-8-one, (1 α ,2 α ,4 α ,5 α)-)	14224-86-3	**	8.8±0.1	EI	3492
	C ₈ H ₁₀ O (Tricyclo[3.2.1.0 ^{2,4}]octan-8-one, <i>exo</i> -)	7076-83-7	**	9.2±0.1	EI	3492
	C ₆ H ₄ (OCH ₃)C ₄ H ₉ (Benzene, 1-butyl-3-methoxy-)	20893-43-0	CH ₂ =CHCH ₃	10.52±0.1	EI	3629
	C ₆ H ₄ (OCH ₃)C ₄ H ₉ (Benzene, 1-butyl-4-methoxy-)	18272-84-9	CH ₂ =CHCH ₃	10.38±0.1	EI	3629
	C ₁₆ H ₁₈ O (Benzene, 1-methoxy-3-(3-phenylpropyl)-)	67081-95-2		9.7±0.1	EI	4925
	C ₁₇ H ₁₇ D ₃ O ₂ (Benzene, 1-methoxy-3-[3-(4-methoxy- <i>d</i> ₃ -phenyl)propyl]-)	67081-97-4		9.8±0.1	EI	4925
	C ₆ H ₅ OOCCOCH ₃ (Carbonic acid, ethyl phenyl ester)	3878-46-4	CO ₂	10.0	EI	3479
C₈H₁₂O⁺	C ₇ H ₉ (OCH ₃) (Bicyclo[2.2.1]hept-2-ene, 5-methoxy- <i>endo</i> -)	17190-92-0	**	8.69±0.03 (V)	PE	4468
	C ₇ H ₉ (OCH ₃) (Bicyclo[2.2.1]hept-2-ene, 5-methoxy- <i>exo</i> -)	17190-87-3	**	8.68±0.03 (V)	PE	4468
	C ₇ H ₉ (OCH ₃) (Bicyclo[2.2.1]hept-2-ene, 7-methoxy- <i>syn</i> -)	36197-25-8	**	8.84±0.03 (V)	PE	4468
			**	8.95 (V)	PE	4511
	C ₇ H ₉ (OCH ₃) (Bicyclo[2.2.1]hept-2-ene, 7-methoxy- <i>anti</i> -)	13041-10-6	**	9.02±0.03 (V)	PE	4468
			**	9.11 (V)	PE	4511
	C ₄ H ₃ O(<i>tert</i> -C ₄ H ₉) (Furan, 2-(1,1-dimethylethyl)-)	7040-43-9	**	8.32	CTS	4382
	C ₄ H ₃ O(<i>tert</i> -C ₄ H ₉) (Furan, 3-(1,1-dimethylethyl)-)	7040-42-8	**	8.58	CTS	4382
	C ₈ H ₁₂ O (Bicyclo[2.2.2]octan-2-one)	2716-23-6	**	9.10 (V)	PE	4285
	C ₈ H ₁₁ OH (Bicyclo[2.2.2]oct-2-en-1-ol)	68211-36-9	**	9.21±0.05 (V)	PE	4842
	<i>anti</i> -C ₈ H ₁₁ OH (Bicyclo[2.2.2]oct-5-en-2-ol-(1 α ,2 α ,4 α)-)	6688-07-9	**	9.14±0.02 (V)	PE	4703
	<i>syn</i> -C ₈ H ₁₁ OH (Bicyclo[2.2.2]oct-5-en-2-ol-(1 α ,2 β ,4 α)-)	19245-72-8	**	9.25±0.02 (V)	PE	4703
	C ₆ H ₁₀ (OH)C \equiv CH (Cyclohexanol, 1-ethynyl-)	78-27-3	**	10.6 (V)	PE	4847

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₈H₁₂O⁺	C ₈ H ₁₂ O (2-Cycloocten-1-one)	1728-25-2	**	9.18 (V)	PE	4285
	C ₈ H ₁₂ O (3-Cycloocten-1-one)	4734-90-1	**	9.12 (V)	PE	4285
	C ₈ H ₁₂ O (9-Oxabicyclo[3.3.1]non-1-ene)	40164-27-0	**	8.60 (V)	PE	4569
	C ₈ H ₁₂ O (9-Oxabicyclo[4.2.1]non-7-ene)	20642-83-5	**	8.89 (V)	PE	4688
	C ₈ H ₁₁ OH (Tricyclo[3.2.1.0 ^{2,4}]octan-8-ol, <i>endo-syn</i> -)	7076-81-5	**	8.8±0.1	EI	3492
	C ₈ H ₁₁ OH (Tricyclo[3.2.1.0 ^{2,4}]octan-8-ol, <i>endo-anti</i> -)	16384-97-7	**	9.1±0.1	EI	3492
	C ₈ H ₁₁ OH (Tricyclo[3.2.1.0 ^{2,4}]octan-8-ol, <i>exo-syn</i> -)	7076-80-4	**	9.1±0.1	EI	3492
	C ₈ H ₁₁ OH		**	9.3±0.1	EI	3492
C₈H₁₄O⁺	C ₇ H ₁₁ (OCH ₃) (Bicyclo[2.2.1]heptane, 2-methoxy- <i>endo</i> -)	10395-55-8	**	9.17±0.03 (V)	PE	4468
	C ₇ H ₁₁ (OCH ₃) (Bicyclo[2.2.1]heptane, 7-methoxy-)	36197-12-3	**	9.27±0.03 (V)	PE	4468
	<i>iso</i> -C ₃ H ₇) ₂ C=C=O	XXXXX-XX-X	**	8.09	EI	4660
	C ₈ H ₁₃ OH (Bicyclo[2.2.2]octan-1-ol)	20534-58-1	**	9.65±0.05 (V)	PE	4842
	C ₈ H ₁₄ (=O) (Cyclooctanone)	502-49-8	**	9.00 (V)	PE	4285
			**	9.08 (V)	PE	5043
			**	9.09±0.02 (V)	PE	3517
	<i>n</i> -C ₃ H ₇ CH=C(CH ₃)C(=O)CH ₃ (3-Hepten-2-one, 3-methyl-)	39899-08-6	**	9.22	PE	5360
	C ₈ H ₁₄ O (9-Oxabicyclo[3.3.1]nonane)	281-05-0	**	9.05 (V)	PE	4569
	C ₈ H ₁₄ O (9-Oxabicyclo[4.2.1]nonane)	284-20-8	**	9.12 (V)	PE	4688
	C ₃ HN(=O) ₂ (<i>iso</i> -C ₃ H ₇) ₂ (2,4-Azetidinedione, 3,3-bis(1-methylethyl)-)	17197-62-5	HN=C=O	9.49	EI	4660
	C ₁₀ H ₁₇ NO ₂ (2,4-Azetidinedione, 1-methyl-3,3-bis(1-methylethyl)-)	38951-66-5	CH ₃ N=C=O	9.39	EI	4660
	C ₁₁ H ₁₆ NO ₂ F ₃ (2,4-Azetidinedione, 3,3-bis(1-methylethyl)-1-(2,2,2-trifluoroethyl)-)	56519-50-7	**	9.55	EI	4660
C₈H₁₆O⁺	<i>tert</i> -C ₄ H ₉ CO(<i>iso</i> -C ₃ H ₇)	5857-36-3	**	8.797±0.005	PE	5519
	<i>n</i> -C ₆ H ₁₃ COCH ₃	111-13-7	**	9.40±0.03	PI	3765
			**	9.38 (V)	PE	4850
	<i>n</i> -C ₄ H ₉ COCH ₂ CH ₂ CH ₃	589-63-9	**	9.10±0.05	PI	3765
C₈H₁₈O⁺	(n-C ₄ H ₉) ₂ O	142-96-1	**	9.40 (V)	PE	4850
			**	9.51±0.015 (V)	PE	4434
	(tert-C ₄ H ₉) ₂ O (1,1'Oxybis (1,1-Dimethylethane))	XXXXX-XX-X	**	8.81	PE	4577
C₉H₈O⁺	CH≡CCH(OH)C ₆ H ₅ (Benzenemethanol, α-ethynyl-)	4187-87-5	**	10.69 (V)	PE	4847
	C ₇ H ₄ (=O)(=CH ₂) ₂ (Bicyclo[2.2.1]hept-2-en-7-one, 5,6-bis(methylene)-)	57297-57-1	**	8.57±0.03 (V)	PE	4665
	C ₉ H ₈ =O (Bicyclo[4.2.1]nona-2,4,7-trien-9-one)	34733-74-9	**	8.28 (V)	PE	4363
	C ₉ H ₈ (=O) (1H-Inden-1-one, 2,3-dihydro-)	83-33-0	**	9.31	EI	4863

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_6H_9O^+$	$C_6H_2(CH_3)_2(CH_2D)CHO$ (Benzaldehyde, 2,4-dimethyl-5-(methyl- <i>d</i> -)-)	38479-87-7	CH_2D	12.3 ± 0.1	EI	4041
	$C_6H_2(CH_3)_2(CH_2D)CHO$ (Benzaldehyde, 2,5-dimethyl-4-(methyl- <i>d</i> -)-)	38479-86-6	CH_2D	11.4 ± 0.1	EI	4041
$C_6H_8DO^+$	$C_6H_2(CH_3)_2(CH_2D)CHO$ (Benzaldehyde, 2,4-dimethyl-5-(methyl- <i>d</i> -)-)	38479-87-7	CH_3	11.5 ± 0.1	EI	4041
	$C_6H_2(CH_3)_2(CH_2D)CHO$ (Benzaldehyde, 2,5-dimethyl-4-(methyl- <i>d</i> -)-)	38479-86-6	CH_3	11.4 ± 0.1	EI	4041
$C_9H_{10}O^+$	$C_9H_{10}O$ (2H-1-Benzopyran, 3,4-dihydro-)	493-08-3	**	7.93	PE	4573
	$C_6H_6(=O)(=CH_2)_2$ (Bicyclo[2.2.1]heptan-7-one, 2,3-bis(methylene)-)	38680-06-7	**	8.64 ± 0.03 (V)	PE	4665
	$C_9H_{10}O$ (2-Cyclopropen-1-one, 2,3-dicyclopropyl-)	42152-37-4	**	8.55 (V)	PE	5390
	$C_6H_4(CH_3)COCH_3$ (Ethanone, 1-(2-methylphenyl-))	577-16-2	**	9.15 (V)	PE	5272
	$C_6H_4(CH_3)COCH_3$ (Ethanone, 1-(3-methylphenyl-))	585-74-0	**	9.14 (V)	PE	5272
	$C_6H_4(CH_3)COCH_3$ (Ethanone, 1-(4-methylphenyl-))	122-00-9	**	9.12 (V)	PE	5272
	$C_6H_4(OCH_3)CH_2CH_2OCOCH_3$ (Phenethyl alcohol, <i>m</i> -methoxy-, acetate)	33709-39-6		8.40	EI	3590
	$C_6H_4(OCH_3)CH_2CH_2OCOCH_3$ (Phenethyl alcohol, <i>p</i> -methoxy-, acetate)	22532-51-0		8.25	EI	3590
	$C_6H_5O(iso-C_3H_7)$ (Benzene, (1-methylethoxy)-)	2741-16-4	**	8.42 (V)	PE	5310
	$C_6H_4(CH_3)OC_2H_5$ (Benzene, 1-ethoxy-2-methyl-)	614-71-1	**	8.32 (V)	PE	4327
$C_9H_{12}O^+$	$C_6H_4(CH_3)OC_2H_5$ (Benzene, 1-ethoxy-4-methyl-)	622-60-6	**	8.21 (V)	PE	5310
	$C_6H_3(CH_3)_2OCH_3$ (Benzene, 1-methoxy-2,4-dimethyl-)	6738-23-4	**	8.13 (V)	PE	4327
	$C_6H_3(CH_3)_2OCH_3$ (Benzene, 2-methoxy-1,3-dimethyl-)	1004-66-6	**	7.95 (V)	PE	5272
	<i>syn</i> - $C_9H_{11}OH$ (Bicyclo[4.2.1]nona-2,4-dien-9-ol <i>syn</i> -)	64725-61-7	**	8.10 ± 0.02	PE	3890
	<i>anti</i> - $C_9H_{11}OH$ (Bicyclo[4.2.1]nona-2,4-dien-9-ol <i>anti</i> -)	64725-60-6	**	8.51 (V)	PE	5272
	$C_9H_{12}(=O)$ (Bicyclo[4.2.1]non-7-en-9-one)	42948-91-4	**	8.53 (V)	PE	4327
	$C_9H_{12}(=O)$ (Tricyclo[3.2.1.1 ^{3,6}]nonan-2-one)	XXXXX-XX-X	**	8.62 ± 0.02 (V)	PE	4703
	$C_9H_{12}(=O)$ (Tricyclo[3.2.1.1 ^{3,6}]nonan-7-one)	XXXXX-XX-X	**	8.43 ± 0.02 (V)	PE	4703
	$C_{10}H_{12}O_2$ (2,5-Cyclohexadiene-1,4-dione, 2,3,5,6-tetramethyl-)	527-17-3	CO	9.10 (V)	PE	4363
	$C_9H_{14}(=O)$ (Bicyclo[4.2.1]nonan-9-one)	14252-11-0	**	8.67 (V)	PE	5043
	$C_9H_{14}(=O)$ (Bicyclo[4.3.0]nonan-7-one)	XXXXX-XX-X	**	8.81 (V)	PE	5043
	$C_9H_{14}(=O)$ (Bicyclo[4.3.0]nonan-7-one)	XXXXX-XX-X	**	10.1 ± 0.05	PI	3523
	$C_9H_{14}(=O)$ (Bicyclo[4.3.0]nonan-7-one)	XXXXX-XX-X	**	8.90 (V)	PE	4363
	$C_9H_{14}(=O)$ (Bicyclo[4.3.0]nonan-7-one)	XXXXX-XX-X	**	9.08 ± 0.08	EI	5038
	$C_9H_{14}(=O)$ (Bicyclo[4.3.0]nonan-7-one)	XXXXX-XX-X	**			

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₉H₁₄O⁺	C ₉ H ₁₄ (=O) (Bicyclo[4.3.0]nonan-8-one)	XXXXXX-XX-X	**	9.14±0.08	EI	5038
	<i>syn</i> -C ₉ H ₁₃ OH (Bicyclo[4.2.1]non-3-en-9-ol <i>syn</i> -)	64725-59-3	**	9.14±0.02 (V)	PE	4703
	<i>anti</i> -C ₉ H ₁₃ OH (Bicyclo[4.2.1]non-3-en-9-ol <i>anti</i> -)	64725-58-2	**	9.11±0.02 (V)	PE	4703
	C ₈ H ₁₁ OCH ₃ (Bicyclo[2.2.2]oct-2-ene, 1-methoxy-)	25489-02-5	**	9.17±0.05 (V)	PE	4842
	C ₈ H ₁₁ OCH ₃ (Bicyclo[2.2.2]oct-2-ene, 5-methoxy-)	56206-38-3	**	8.77±0.03 (V)	PE	4468
	C ₁₀ H ₁₅ (=O)CH ₃ (Bicyclo[4.4.0]decan-3-one, 2-methyl-)	XXXXXX-XX-X	**	10.50±0.08	EI	5038
	C ₁₀ H ₁₅ (=O)CH ₃ (Bicyclo[4.4.0]decan-3-one, 4-methyl-)	XXXXXX-XX-X	**	10.65±0.08	EI	5038
C₉H₁₆O⁺	C ₈ H ₁₃ OCH ₃ (Bicyclo[2.2.2]octane, 1-methoxy-)	7697-14-5	**	9.17±0.05 (V)	PE	4842
	C ₈ H ₁₃ OCH ₃ (Bicyclo[2.2.2]octane, 2-methoxy-)	56206-39-4	**	9.07±0.03	PE	4468
C₉H₁₈O⁺	<i>n</i> -C ₇ H ₁₅ COCH ₃	821-55-6	**	9.38 (V)	PE	4850
	<i>iso</i> -C ₄ H ₉) ₂ CO	108-83-8	**	9.04±0.03	PI	3765
			**	8.98±0.01	PE	5519
	<i>tert</i> -C ₄ H ₉) ₂ CO	815-24-7	**	8.67±0.01	PE	4535
			**	8.67±0.02	PE	5519
			**	8.79±0.05	EI	4535
			**	8.65±0.03	PI	3765
C₁₀H₈O⁺	C ₁₀ H ₈ O (2-Cyclopropen-1-one, 2-methyl-3-phenyl-)	26307-30-2	**	8.64 (V)	PE	5390
	C ₁₀ H ₇ OH (1-Naphthalenol)	90-15-3	**	7.76±0.03	PI	5552
			**	7.78 (V)	PE	4466
	C ₁₀ H ₇ OH (2-Naphthalenol)	135-19-3	**	7.85±0.05	PI	5552
			**	7.90 (V)	PE	4466
C₁₀H₁₀O⁺	C(C ₆ H ₅)(C ₂ H ₅)=C=O (1-Buten-1-one, 2-phenyl-)	XXXXXX-XX-X	**	7.94	EI	4660
	C ₃ HN(=O) ₂ C ₂ H ₅ (C ₆ H ₅) (2,4-Azetidinedione, 3-ethyl-3-phenyl-)	42282-82-6	**	8.97	EI	4660
	C ₁₂ H ₁₃ NO ₂ (2,4-Azetidinedione, 3-ethyl-1-methyl-3-phenyl-)	56519-51-8	**	8.83	EI	4660
C₁₀H₁₁O⁺	C ₁₀ H ₁₁ OH (1-Naphthalenol, 1,2,3,4-tetrahydro-)	529-33-9	H	9.67±0.11	EI	4960
	C ₁₀ H ₁₁ OH (2-Naphthalenol, 1,2,3,4-tetrahydro-)	530-91-6	H	11.6	EI	4960
C₁₀H₁₂O⁺	C ₆ H ₄ (OCH ₃)C ₃ H ₅ (Benzene, 1-cyclopropyl-4-methoxy-)	4030-17-5	**	8.05 (V)	PE	4815
	C ₆ H ₄ (OCH ₃)CH ₂ CH=CH ₂ (Benzene, 1-methoxy-4-(2-propenyl)-)	140-67-0	**	8.20 (V)	PE	4211
	C ₁₀ H ₁₁ OH (1-Naphthalenol, 1,2,3,4-tetrahydro-)	529-33-9	**	8.70±0.01	EI	4960

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{10}H_{12}O^+$	$C_{10}H_{11}OH$ (2-Naphthalenol, 1,2,3,4-tetrahydro-)	530-91-6	**	8.67 ± 0.02	EI	4960
$C_{10}H_{11}DO^+$	$C_6H_2(CH_3)_2(CH_2D)CHO$ (Benzaldehyde, 2,4-dimethyl-5-(methyl- <i>d</i>)-)	38479-87-7	**	8.7 ± 0.1	EI	4041
	$C_6H_2(CH_3)_2(CH_2D)CHO$ (Benzaldehyde, 2,5-dimethyl-4-(methyl- <i>d</i>)-)	38479-86-6	**	8.7 ± 0.1	EI	4041
$C_{10}H_{14}O^+$	$C_6H_5O(tert-C_4H_9)$ (Benzene, (1,1-dimethylethoxy-))	6669-13-2	**	8.66 (V)	PE	4327
			**	8.71 ± 0.015 (V)	PE	
			**	8.77 (V)	PE	5310
	$C_6H_4(CH_3)O(iso-C_3H_7)$ (Benzene, 1-methyl-2-(1-methylethoxy)-)	33426-60-7	**	8.24 (V)	PE	5310
	$C_6H_3(CH_3)_2OC_2H_5$ (Benzene, 2-ethoxy-1,3-dimethyl-)	26620-08-6	**	8.49 (V)	PE	4327
	$C_6H_2(CH_3)_3OCH_3$ (Benzene, 2-methoxy-1,3,5-trimethyl-)	4028-66-4	**	8.28 (V)	PE	5310
	$C_6H_4(CH_3)OCH(CH_3)_2$ (Benzene, 1-methyl-4-(1-methylethoxy)-)	22921-10-4	**	8.09 (V)	PE	4327
	<i>syn</i> - $C_9H_{11}OCH_3$ (Bicyclo[4.2.1]nona-2,4-diene, 9-methoxy- <i>syn</i> -)	64725-62-8	**	8.28 ± 0.02 (V)	PE	4703
	$C_6H_4(OH)C_4H_9$ (Phenol, 3-butyl-)	4074-43-5	**	8.92 ± 0.1	EI	3629
	$C_6H_4(OH)C_4H_9$ (Phenol, 4-butyl-)	1638-22-8	**	8.67 ± 0.1	EI	3629
	$C_6H_4(OH)C_4H_9$ (Phenol, 2-(1,1-dimethylethyl-))	88-18-6	**	8.10 ± 0.02	PE	3890
	$C_{10}H_{14}(=O)$ (Tricyclo[3.3.1.1 ^{3,7}]decanone)	700-58-3	**	8.67 (V)	PE	5043
			**	8.59	PE	3886
			**	8.80 ± 0.02 (V)	PE	4217
	$C_{10}H_{14}(=O)$ (Tricyclo[4.2.1.1 ^{2,6}]decan-8-one)	XXXXX-XX-X	**	8.57 (V)	PE	5043
	$C_{10}H_{14}(=O)$ (Tricyclo[4.2.1.1 ^{3,6}]decan-8-one)	XXXXX-XX-X	**	8.96 (V)	PE	5043
$C_{10}H_{16}O^+$	$C_{10}H_{16}O$ (Bicyclo[2.2.1]heptan-2-one, 1,7,7-trimethyl-)	76-22-2	**	8.76 ± 0.03	PI	3765
	$C_{10}H_{15}OH$ (Tricyclo[3.3.1.1 ^{3,7}]decan-1-ol)	768-95-6	**	9.09 ± 0.05	PE	3886
	$C_{10}H_{15}OH$ (Tricyclo[3.3.1.1 ^{3,7}]decan-2-ol)	700-57-2	**	9.09 ± 0.07	PE	3886
$C_{10}H_{18}O^+$	$C_6H_8(tert-C_4H_9)(OH)$ (2-Cyclohexen-1-ol, 4-(1,1-dimethylethyl)- <i>cis</i> -)	35376-39-7	**	9.33 ± 0.02 (V)	PE	5420
	$C_6H_8(tert-C_4H_9)(OH)$ (2-Cyclohexen-1-ol, 4-(1,1-dimethylethyl)- <i>trans</i> -)	35376-40-0	**	9.18 ± 0.02 (V)	PE	5420
	$C_6H_9O(tert-C_4H_9)$ (Cyclohexanone, 4- <i>tert</i> -butyl-)	98-53-3	**	9.04	PE	5085
$C_{10}H_{20}O^+$	$C_6H_{10}(tert-C_4H_9)(OH)$ (Cyclohexanol, 4-(1,1-dimethylethyl)- <i>cis</i> -)	937-05-3	**	9.82 ± 0.02 (V)	PE	5420
	$C_6H_{10}(tert-C_4H_9)(OH)$ (Cyclohexanol, 4-(1,1-dimethylethyl)- <i>trans</i> -)	21862-63-5	**	9.91 ± 0.02 (V)	PE	5420

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{11}H_8O^+$	$C_{11}H_8O$ (7-H-Benzocyclohepten-7-one)	4443-91-8	**	8.61 ± 0.03 (V)	PE	4391
	$C_{10}H_7CHO$ (1-Naphthalenecarboxaldehyde)	66-77-3	**	8.43 ± 0.03	PI	5552
$C_{11}H_{10}O^+$	$C_{10}H_7OCH_3$ (Naphthalene, 1-methoxy-)	2216-69-5	**	7.72 (V)	PE	3781
	$C_{10}H_7OCH_3$ (Naphthalene, 2-methoxy-)	93-04-9	**	7.87 (V)	PE	3781
$C_{11}H_{12}O^+$	<i>syn</i> - $C_{11}H_{11}OH$ (1,4-Methanonaphthalen-9-ol, 1,2,3,4-tetrahydrostereoisomer)	1198-20-5	**	8.80 ± 0.02 (V)	PE	4703
	$C_{20}H_{26}O_2$ (<i>D</i> -Homoestra-1,3,5(10)-trien-17a-one, 3-methoxy-)	1232-89-9	**	8.62 ± 0.02 (V)	PE	4703
	$C_{20}H_{26}O_2$ (<i>D</i> -Homoestra-1,3,5(10)-trien-17a-one, 3-methoxy-)	1232-88-8		11.46 ± 0.05	EI	3571
	$C_{20}H_{26}O_2$ (<i>D</i> -Homoestra-1,3,5(10)-trien-17a-one, 3-methoxy-, (8 α)-)			11.20 ± 0.05	EI	3571
	$C_6(CH_3)_4(CH_2D)CHO$ (Benzaldehyde, 2,3,5,6-tetramethyl-4-(methyl- <i>d</i>)-)	43022-36-2	CH_2D	11.2 ± 0.1	EI	4041
$C_{11}H_{14}O^+$	$C_6H_4(OCH_3)C_3H_4(CH_3)$ (Benzene, 1-methoxy-4-(1-methylcyclopropyl)-)	63340-01-2	**	8.09 (V)	PE	4815
	$C_{11}H_{14}O$ (2-Cyclopropen-1-one,2,3-bis(1-methylcyclopropyl)-)	58287-34-6	**	8.44 (V)	PE	5390
	$C_6H_5CO(CH_2)_3CH_3$ (1-Pentanone, 1-phenyl-)	1009-14-9	**	9.3 (V)	PE	4804
	<i>tert</i> - $C_4H_9COC_6H_5$ (1-Propanone, 2,2 dimethyl-1-phenyl-)	938-16-9	**	8.70	PE	4395
			**	9.02 (V)	PE	4804
$C_{11}H_{13}DO^+$	$C_6(CH_3)_4(CH_2D)CHO$ (Benzaldehyde, 2,3,5,6-tetramethyl-4-(methyl- <i>d</i>)-)	43022-36-2	CH_3	11.2 ± 0.1	EI	4041
$C_{11}H_{16}O^+$	$C_6H_4(CH_3)O(tert-C_4H_9)$ (Benzene, 1-(1,1-dimethylethoxy)-2-methyl-)	15359-96-3	**	8.45 (V)	PE	5310
	$C_6H_4(OCH_3)C_4H_9$ (Benzene, 1-butyl-3-methoxy-)	20893-43-0	**	8.17 ± 0.1	EI	3629
	$C_6H_4(OCH_3)C_4H_9$ (Benzene, 1-butyl-4-methoxy-)	18272-84-9	**	8.24 ± 0.1	EI	3629
	$C_6H_4(CH_3)OC(CH_3)_3$ (Benzene, 1-(1,1-dimethylethoxy)-4-methyl-)	15359-98-5	**	8.23 (V)	PE	4327
	$C_6H_3(CH_3)_2OCH(CH_3)_2$ (Benzene, 1,3-dimethyl-2-(1-methylethoxy)-)	54350-31-1	**	8.49 (V)	PE	4327
	$C_6H_2(CH_3)_3OC_2H_5$ (Benzene, 2-ethoxy-1,3,5-trimethyl-)	61248-63-3	**	8.28 (V)	PE	5310
	$C_{10}H_{13}(=O)CH_3$ (2(3 <i>H</i>)-Naphthalenone, 4,4a,5,6,7,8-hexahydro-4a-methyl-)	826-56-2	**	9.6 ± 0.2	EI	4074
$C_{11}H_{18}O^+$	$C_{10}H_{15}(=O)CH_3$ (Bicyclo[4.4.0]decan-3-one, 2-methyl-)	XXXXXX-XX-X	**	9.32 ± 0.08	EI	5038
	$C_{10}H_{15}(=O)CH_3$ (Bicyclo[4.4.0]decan-3-one, 4-methyl-)	XXXXXX-XX-X	**	9.41 ± 0.08	EI	5038
	$C_9H_{13}(=O)(C_2H_5)$ (Bicyclo[4.3.0]nonan-7-one, 1-ethyl-)	XXXXXX-XX-X	**	9.40 ± 0.08	EI	5038

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{11}H_{18}O^+$	$C_9H_{13}(=O)(C_2H_5)$ (Bicyclo[4.3.0]nonan-8-one, 7-ethyl-)	XXXXX-XX-X	**	9.45 ± 0.08	EI	5038
	$C_3(C_4H_9)_2=O$ (2-Cyclopropen-1-one, 2,3-bis(1,1-dimethylethyl)-)	19985-79-6	**	8.23 (V)	PE	4361
	$C_6H_6(CH_3)(OH)C_4H_8$ (4a(2H)-Naphthalenol, 1,3,4,7,8,8a-hexahydro-8a-methyl- <i>cis</i> -)	68211-44-9	**	8.36 (V)	PE	5390
	$C_6H_6(CH_3)(OH)C_4H_8$ (4a(2H)-Naphthalenol, 1,3,4,7,8,8a-hexahydro-8a-methyl- <i>trans</i> -)	XXXXX-XX-X	**	9.26 ± 0.02 (V)	PE	5420
	$C_6H_6(CH_3)(OH)C_4H_8$ (4a(2H)-Naphthalenol, 1,3,4,7,8,8a-hexahydro-8a-methyl- <i>trans</i> -)	XXXXX-XX-X	**	9.35 ± 0.02 (V)	PE	5420
	$C_{11}H_{17}OH$ (4a(2H)-Naphthalenol, 1,3,4,7,8,8a-hexahydro-8a-methyl- <i>trans</i> -)	67497-82-9	**	9.35 ± 0.05 (V)	PE	4842
	$C_{11}H_{17}OH$ (4a(2H)-Naphthalenol, 1,3,4,7,8,8a-hexahydro-8a-methyl- <i>trans</i> -)	67497-82-9	**	9.35 ± 0.05 (V)	PE	4842
$C_{11}H_{20}O^+$	$C_6H_8(tert-C_4H_9)(OCH_3)$ (Cyclohexene, 3-(1,1-dimethylethyl)-6-methoxy- <i>cis</i> -)	71555-63-0	**	9.29 ± 0.03 (V)	PE	5420
	$C_6H_8(tert-C_4H_9)(OCH_3)$ (Cyclohexene, 3-(1,1-dimethylethyl)-6-methoxy- <i>trans</i> -)	71555-64-1	**	8.97 ± 0.02 (V)	PE	5420
	$C_{11}H_{19}OH$ (Cyclohexanol, 5-(1,1-dimethylethyl)-2-methylene- <i>cis</i> -)	19245-69-3	**	9.18 ± 0.05 (V)	PE	4842
	$C_{11}H_{19}OH$ (Cyclohexanol, 5-(1,1-dimethylethyl)-2-methylene- <i>trans</i> -)	19245-70-6	**	9.18 ± 0.02 (V)	PE	5420
	$C_{11}H_{19}OH$ (Cyclohexanol, 5-(1,1-dimethylethyl)-2-methylene- <i>trans</i> -)	19245-70-6	**	9.37 ± 0.05 (V)	PE	4842
	$C_3H_2(C_4H_9)_2=O$ (Cyclopropanone, 2,3-bis(1,1-dimethylethyl)-, <i>trans</i> -)	14743-58-9	**	8.45 (V)	PE	4361
	$tert-C_4H_9COC(C_2H_5)=C(CH_3)CH_3$ (4-Hexen-3-one, 4-ethyl-2,2,5-trimethyl-)	68165-37-7	**	8.74	PE	5360
	$C_6H_8(CH_3)(OH)C_4H_8$ (4a(2H)-Naphthalenol, octahydro-8a-methyl- <i>cis</i> -)	5173-74-0	**	9.45 ± 0.02 (V)	PE	5420
	$C_{11}H_{19}OH$ (4a(2H)-Naphthalenol, octahydro-8a-methyl- <i>trans</i> -)	5173-73-9	**	9.41 ± 0.05 (V)	PE	4842
	$C_{11}H_{19}OH$ (4a(2H)-Naphthalenol, octahydro-8a-methyl- <i>trans</i> -)	5173-73-9	**	9.41 ± 0.05 (V)	PE	4842
	$C_6H_{10}(tert-C_4H_9)(OCH_3)$ (Cyclohexane, 1-(1,1-dimethylethyl)-4-methoxy- <i>cis</i> -)	15875-99-7	**	9.36 ± 0.02 (V)	PE	5420
	$C_6H_{10}(tert-C_4H_9)(OCH_3)$ (Cyclohexane, 1-(1,1-dimethylethyl)-4-methoxy- <i>trans</i> -)	15876-31-0	**	9.32 ± 0.02 (V)	PE	5420
$C_{12}H_8O^+$	$(C_6H_4)_2O$ (Dibenzofuran)	132-64-9	**	8.09 (V)	PE	5619
			**	8.77	EI	4228
$C_{12}H_{10}O^+$	$(C_6H_5)_2O$ (Benzene, 1,1'-oxybis-)	101-84-8	**	8.09 ± 0.03	PI	5552
	$C_{11}H_7OCH_3$ (7-H-Benzocyclohepten-7-one, 6-methyl-)	4900-73-6	**	8.0	PE	4228
	$C_6H_5C_6H_4OH$ (1,1'-Biphenyl]-2-ol)	90-43-7	**	8.46 ± 0.03 (V)	PE	4391
	$C_6H_5C_6H_4OH$ (1,1'-Biphenyl]-4-ol)	92-69-3	**	7.80 ± 0.02	PE	3702
	$C_{10}H_7COCH_3$ (Ethanone, 1-(1-naphthalenyl)-)	941-98-0	**	7.78 ± 0.03	PI	5552
	$C_{10}H_7COCH_3$ (Ethanone, 1-(2-naphthalenyl)-)	93-08-3	**	8.23 (V)	PE	4466
	$C_{10}H_7C_2H_3O$ (Oxirane, 2-naphthalenyl-)	20861-99-8	**	8.31 (V)	PE	4466
	$C_{10}H_7C_2H_3O$ (Oxirane, 2-naphthalenyl-)	20861-99-8	**	8.21 (V)	PE	5364
	$C_{10}H_7C_2H_3O$ (Oxirane, 2-naphthalenyl-)	20861-99-8	**	8.21 (V)	PE	5364

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{12}H_{12}O^+$	$C_{11}H_9(OCH_3)$ (1,4-Methanonaphthalene, 1,4-dihydro-5-methoxy-)	53308-23-9	**	8.10 ± 0.05 (V)	PE	5019
			**	8.10 (V)	PE	4835
	$C_{11}H_9(OCH_3)$ (1,4-Methanonaphthalene, 1,4-dihydro-6-methoxy-)	4897-71-6	**	7.87 ± 0.05	PE	5019
			**	7.87 (V)	PE	4835
$C_{12}H_{14}O^+$	<i>syn</i> - $C_{11}H_{11}OCH_3$ 1,4-Methanonaphthalene, 1,2,3,4-tetrahydro-9-methoxy-stereoisomer)	64725-57-1	**	8.46 ± 0.02 (V)	PE	4703
	$C_{12}H_{14}O$ (4a,8a-Ethanonaphthalene-9-one, 1,4,5,8-tetrahydro-)	60964-67-2	**	8.85 ± 0.05 (V)	PE	4593
	<i>anti</i> - $C_{11}H_{11}OCH_3$ (1,4-Methanonaphthalene, 1,2,3,4-tetrahydro-9-methoxy-stereoisomer)	64725-57-1	**	8.61 ± 0.02 (V)	PE	4703
	<i>anti</i> - $C_{11}H_{10}(OH)CH_3$ (1,4-Methanonaphthalen-9-ol, 1,2,3,4-tetrahydro-6-methyl-(1 α ,4 α ,6R*)-)	1201-10-1	**	8.31 ± 0.02 (V)	PE	4703
	<i>syn</i> - $C_{11}H_{10}(OH)CH_3$ (1,4-Methanonaphthalen-9-ol, 1,2,3,4-tetrahydro-6-methyl-(1 α ,4 α 9S*)-)	16306-87-7	**	8.41 ± 0.02 (V)	PE	4703
$C_{12}H_{16}O^+$	$C_6H_4(OCH_3)C_3H_4(C_2H_5)$ (Benzene, 1-(1-ethylcyclopropyl)-4-methoxy-)	63340-02-3	**	8.11 (V)	PE	4815
	$C_6H_4(C(CH_3)_3)COCH_3$ (Ethanone, 1-[4-(1,1-dimethylethyl)phenyl]-)	943-27-1	**	9.01 ± 0.05 (V)	PE	5097
	$C_6H_4(CH_3)CO(CH_2)_3CH_3$ (1-Pentanone, 1-(4-methylphenyl)-)	1671-77-8	**	9.02 (V)	PE	4804
$C_{12}H_{15}DO^+$	$C_6(CH_3)_4(CH_2D)CHO$ (Benzaldehyde, 2,3,5,6-tetramethyl-4-(methyl-d)-)	43022-36-2	**	8.3 ± 0.1	EI	4041
$C_{12}H_{18}O^+$	$C_6H_2(CH_3)_3O(iso-C_3H_7)$ (Benzene, 1,3,5-trimethyl-2-(1-methylethoxy)-)	13605-05-5	**	8.15 (V)	PE	5310
	$C_6H_3(CH_3)_2OC(CH_3)_3$ (Benzene, 2-(1,1-dimethylethoxy)-1,3-dimethyl-)	54350-32-2	**	8.47 (V)	PE	4327
	$C_{10}H_{15}COCH_3$ (Ethanone, 1-tricyclo[3.3.1.1 ^{3,7}]dec-1-yl-)	1660-04-4	**	8.82 ± 0.05	PE	3851
$C_{12}H_{20}O^+$	$C_6H_6(CH_3)(OCH_3)C_4H_8$ (Naphthalene, 1,2,3,4,4a,5,6,8a-octahydro-8a-methoxy-4a-methyl- <i>cis</i> -)	71546-87-7	**	9.34 ± 0.02 (V)	PE	5420
	$C_6H_6(CH_3)(OCH_3)C_4H_8$ (Naphthalene, 1,2,3,4,4a,5,6,8a-octahydro-8a-methoxy-4a-methyl- <i>trans</i> -)	68211-38-1	**	9.00 ± 0.05 (V)	PE	4842
			**	9.35 ± 0.02 (V)	PE	5420
$C_{12}H_{22}O^+$	$C_{11}H_{19}OCH_3$ (Cyclohexane, 1-(1,1-dimethylethyl)-3-methoxy-4-methylene- <i>cis</i> -)	68211-39-2	**	8.97 ± 0.05 (V)	PE	4842
			**	8.97 ± 0.02 (V)	PE	5420
	$C_{11}H_{19}OCH_3$ (Cyclohexane, 1-(1,1-dimethylethyl)-3-methoxy-4-methylene- <i>trans</i> -)	68211-40-5	**	9.30 ± 0.05 (V)	PE	4842
			**	9.30 ± 0.02 (V)	PE	5420
	$C_6H_8(CH_3)(OCH_3)C_4H_8$ (Naphthalene, decahydro-4a-methoxy-8a-methyl- <i>cis</i> -)	17987-54-1	**	9.08 ± 0.02 (V)	PE	5420
	$C_{11}H_{19}OCH_3$ (Naphthalene, decahydro-4a-methoxy-8a-methyl- <i>trans</i> -)	17987-53-0	**	9.10 ± 0.05 (V)	PE	4842
$C_{13}H_8O^+$	$(C_6H_4)_2CO$ (9H-Fluoren-9-one)	486-25-9	**	8.36 ± 0.03	PI	5552

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{13}H_8O^+$	$(C_6H_5)_2CO$	486-25-9	**	8.36 ± 0.02	PI	3523
	$C_{13}H_8(=O)$ (1H-Phenalen-1-one)	548-39-0	**	8.20 ± 0.04 (V)	PE	5193
	$C_6H_5COC_6H_4NH_2$ (Methanone, (2-aminophenyl)phenyl-)	2835-77-0		11.2 ± 0.2	EI	4358
	$C_6H_5COC_6H_4NH_2$ (Methanone, (3-aminophenyl)phenyl-)	2835-78-1		12.3 ± 0.3	EI	4358
	$C_6H_5COC_6H_4NH_2$ (Methanone, (4-aminophenyl)phenyl-)	1137-41-3		11.5 ± 0.2	EI	4358
$C_{13}H_9O^+$	$C_6H_5COC_6H_4Cl$ (Methanone, (2-chlorophenyl)phenyl-)	5162-03-8		10.9 ± 0.2	EI	4358
	$C_6H_5COC_6H_4Cl$ (Methanone, (3-chlorophenyl)phenyl-)	1016-78-0		11.0 ± 0.1	EI	4358
	$C_6H_5COC_6H_4Cl$ (Methanone, (4-chlorophenyl)phenyl-)	134-85-0		11.1 ± 0.2	EI	4358
$C_{13}H_{10}O^+$	$C_6H_5C_6H_4CHO$ ([1,1'-Biphenyl]-4-carboxaldehyde)	3218-36-8	**	8.47 ± 0.03	PI	5552
	$(C_6H_5)_2CO$ (Methanone, diphenyl-)	119-61-9	**	9.14 ± 0.03	PI	4031
			**	9.14 ± 0.03	PI	4057
			**	9.4	PI	3586
			**	9.05 ± 0.05 (V)	PE	4844
			**	9.4 ± 0.1	EI	5493
			**	9.45 ± 0.1	EI	4335
			**	9.45 ± 0.1	EI	4358
			**	9.46	EI	3792
	$(C_6H_5)_2CH_2OC(=O)$ (Dibenz[b,e]oxepin-11(6H)-one)	4504-87-4	CO	11.5	EI	5340
$C_{13}H_{11}O^+$	$C_6H_5CH_2C_6H_4OCH_3$ (Benzene, 1-methoxy-4-(phenylmethyl)-)	834-14-0	CH ₃	11.9 ± 0.1	EI	3807
$C_{13}H_{12}O^+$	$C_{11}H_9(COCH_3)$ (Ethanone, 1-(1,4-dihydro-1,4-methanonaphthalen-5-yl)-)	61346-78-9	**	8.49 ± 0.05 (V)	PE	5019
	$C_{11}H_9(COCH_3)$ (Ethanone, 1-(1,4-dihydro-1,4-methanonaphthalen-6-yl)-)	63509-77-3	**	8.57 ± 0.05 (V)	PE	5019
	$C_6H_5CH_2OC_6H_5$ (Benzene, phenoxymethyl-)	946-80-5	**	8.31	CT	5336
	$C_{11}H_9O(CH_3)_2$ (7H-Benzocyclohepten-7-one, 6,8-dimethyl-)	2484-16-4	**	8.29 ± 0.03 (V)	PE	4391
	$C_{11}H_9O(CH_3)_2$ (7H-Benzocyclohept-7-one, 2,3-dimethyl-)	55027-90-2	**	8.25 ± 0.03 (V)	PE	4391
	$C_6H_5CH_2C_6H_4OH$ (Phenol, 4-(phenylmethyl)-)	101-53-1	**	8.45 ± 0.05	EI	3806
$C_{13}H_{18}O^+$	$C_{13}H_{18}O$ (Benzene, 1-methoxy-4-[1-(1-methylethyl)cyclopropyl]-)	63340-03-4	**	8.10 (V)	PE	4815
$C_{13}H_{20}O^+$	$C_6H_2(CH_3)_3O(tert-C_4H_9)$ (Benzene, 2-(1,1-dimethylethoxy)-1,3,5-trimethyl-)	61248-61-1	**	8.27 (V)	PE	5310
	$C_5H_2(O)(C_4H_9)_2$ (2,4-Cyclopentadien-1-one, 2,5-bis(1,1-dimethylethyl)-)	36319-88-7	**	8.50 (V)	PE	4293
	$C_5H_2(O)(C_4H_9)_2$ (2,4-Cyclopentadien-1-one, 3,4-bis(1,1-dimethylethyl)-)	28786-71-2	**	8.60 (V)	PE	4293

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{14}H_{10}O^+$	$C_{14}H_{10}O$ (9(10H)-Anthracenone)	90-44-8	**	8.83 ± 0.03	PI	5552
	$C_{14}H_{10}O$ (Dibenz [<i>b,f</i>]oxepin)	257-05-6	**	8.83 ± 0.03	PI	3523
	$(C_6H_5)_2C=C=O$ (Ethenone, diphenyl-)	525-06-4	**	7.45	PE	4611
	$C_{14}H_{10}O$ (Phenanthro[9,10- <i>b</i>]oxirene, 1a,9b-dihydro-)	585-08-0	**	7.85	EI	4660
	$C_5N(=O)_2(C_6H_5)_3$ (2,4-Azetidinedione, 1,3,3-triphenyl-)	15745-93-4	**	8.19 (V)	PE	5364
	$(C_6H_5)_2CH_2SC(=O)$ (Dibenz[<i>b,e</i>]thiepin-11(6H)-one)	1531-77-7	**	8.24 (V)	OTH	4927
	$(C_6H_5)_2CH_2SC(=O)$	1531-77-7	S	8.46	EI	4660
	$C_{14}H_{10}SO_3$ (Dibenzo[<i>b,e</i>]thiepin-11(6H)-one-5,5-dioxide)	33301-21-2	SO ₂	10.00	EI	5414
$C_{14}H_{12}O^+$	$C_{14}H_{12}O$ (Oxirane, <i>cis</i> -2,3-diphenyl-)	1689-71-0	**	8.68	PE	5260
	$C_{14}H_{12}O$ (Oxirane, <i>trans</i> -2,3-diphenyl-)	1439-07-2	**	8.60	PE	5260
$C_{14}H_{14}O^+$	$C_6H_5CH_2C_6H_4OCH_3$ (Benzene, 1-methoxy-4-(phenylmethyl)-)	834-14-0	**	8.20 ± 0.05	EI	3806
	$C_6H_5CH_2OC_6H_4CH_3$ (Benzene, 1-methyl-4-(phenylmethoxy)-)	834-25-3	**	7.91	CTS	5336
	$C_6H_4(CH_2CH_2)_2C_4H_2O$ (15-Oxatricyclo[8.2.2.1 ^{4,7}]pentadeca-4,6,10,12,13-pentaene)	5040-51-7	**	7.78 (V)	PE	5575
$C_{14}H_{20}O^+$	$C_{14}H_{20}O$ (Benzene, 1-[1-(1,1-dimethylethyl)cyclopropyl]-4-methoxy-)	63340-04-5	**	8.05 (V)	PE	4815
$C_{14}H_{22}O^+$	$C_6H_3(C_4H_9)_2OH$ (Phenol, 2,6-bis(1,1-dimethylethyl)-)	128-39-2	**	7.70 ± 0.02	PE	3890
	$C_6H_3(C_4H_9)_2OH$ (Phenol, 3,5-bis(1,1-dimethylethyl)-)	1138-52-9	**	7.90 ± 0.02	PE	3890
$C_{15}H_{10}O^+$	$C_{14}H_9CHO$ (9-Anthracenecarboxaldehyde)	642-31-9	**	7.69 ± 0.03	PI	5552
	$C_{15}H_{10}O$ (2-Cyclopropen-1-one, 2,3-diphenyl-)	886-38-4	**	7.67 ± 0.03 (V)	PE	4887
	$C_{15}H_{10}O$ (5H-Dibenzo[<i>a,c</i>]cyclohepten-5-one)	4444-43-3	**	8.47 (V)	PE	5390
	$C_{15}H_{10}O$	4444-43-3	**	10.56 (V)	PE	4856
	$C_{15}H_{10}O$ (5H-Dibenzo[<i>a,d</i>]cyclohepten-5-one)	2222-33-5	**	8.5 ± 0.1 (V)	PE	4391
	$C_{15}H_{10}O$	2222-33-5	**	8.06 \pm 0.03 (V)	PE	4391
$C_{15}H_{12}O^+$	$C_{14}H_9OCH_3$ (Anthracene, 9-methoxy-)	2395-96-2	**	7.21 ± 0.03 (V)	PE	4887
	<i>trans</i> - $C_6H_5CH=CHC_6H_4CHO$ (Benzaldehyde, 4-(2-phenylethenyl)-)	32555-96-7	**	7.92 ± 0.04	PI	5552

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{15}H_{15}O^+$	$C_{20}H_{22}O_2$ (<i>D</i> -Homoestra-1,3,5(10),6,8-pentaen-17a-one, 3-methoxy-)	1232-90-2		11.46 ± 0.05	EI	3571
	$C_{20}H_{22}O_2$ (<i>D</i> -Homoestra-1,3,5(10),6,8-pentaen-17a-one, 3-methoxy-, (14 β)-)	1232-91-3		10.84 ± 0.09	EI	3571
$C_{16}H_{10}O^+$	$C_{16}H_{10}O$ (4,6-Ethenodibenz[<i>b,f</i>]oxepine, (<i>Z,Z</i>)-)	42073-03-0	**	7.95 (V)	PE	4088
$C_{16}H_{12}O^+$	$C_{14}H_9C_2H_3O$ (Oxirane,9-anthracenyl-)	61695-73-6	**	7.41 (V)	PE	5364
$C_{16}H_{16}O^+$	$C_{16}H_{16}O$ (6,12-Methano-7H-benzocycloundecen-14-one,8,9,10,11-tetrahydro-)	25401-39-2	**	8.31 ± 0.03 (V)	PE	4391
	$C_{20}H_{22}O_2$ (<i>D</i> -Homoestra-1,3,5(10),6,8-pentaen-17a-one, 3-methoxy-)	1232-90-2		10.79 ± 0.07	EI	3571
	$C_{20}H_{22}O_2$ (<i>D</i> -Homoestra-1,3,5(10),6,8-pentaen-17a-one, 3-methoxy-, (14 β)-)	1232-91-3		10.44 ± 0.11	EI	3571
$C_{16}H_{18}O^+$	$C_{16}H_{18}O$ (Benzene, 1-methoxy-3-(3-phenylpropyl)-)	67081-95-2	**	8.15 ± 0.05	EI	4925
	$C_{16}H_{18}O$ (Benzene, 1-methoxy-4-(3-phenylpropyl)-)	40715-68-2	**	8.18 ± 0.05	EI	4925
$C_{17}H_{12}O^+$	$C_{17}H_{12}O$ (Methanone, phenyl-1-azulenyl-)	XXXXXX-XX-X	**	7.55 (V)	PE	5397
$C_{17}H_{14}O^+$	$C_{15}H_8O(CH_3)_2$ (8H-Cyclohepta[<i>b</i>]naphthalen-8-one,7,9-dimethyl-)	39787-00-3	**	7.83 ± 0.03 (V)	PE	4391
	$C_6H_5CH_2OC_{10}H_7$ (Naphthalene,1-(phenylmethoxy)-)	607-58-9	**	7.63	CTS	5336
	$C_6H_5CH_2OC_{10}H_7$ (Naphthalene,2-(phenylmethoxy)-)	613-62-7	**	7.82	CTS	5336
$C_{17}H_{18}O^+$	$C_{17}H_{18}O$ (6,13-Methanobenzocyclododecene-15-one,7,8,9,10,11,12-hexahydro-)	55027-91-3	**	8.2 ± 0.1 (V)	PE	4391
$C_{17}H_{20}O^+$	$C_{11}H_6O[(CH_3)_2CH]_2$ (7-H-Benzocyclohepten-7-one,6,8-bis(1-methylethyl)-)	55027-89-9	**	8.15 ± 0.03 (V)	PE	4391
$C_{18}H_{12}O^+$	$C_{16}H_9C_2H_3O$ (Oxirane,1-pyrenyl-)	61695-74-7	**	7.43 (V)	PE	5364
$C_{18}H_{16}O^+$	$C_{10}H_6(CH_2CH_2)_2C_4H_2O$ (8,11-Epoxy-5,14-ethenobenzocyclododecene,6,7,12,13-tetrahydro-)	24178-85-6	**	7.46 (V)	PE	5575
$C_{18}H_{18}O^+$	$C_6H_8(=O)(C_6H_5)_2$ (Cyclohexanone, 4,4-diphenyl-)	4528-68-1	**	8.8 ± 0.2	EI	4074
$C_{18}H_{20}O^+$	$C_{18}H_{20}O$ (6,14-Methanobenzocyclotridecene-16-one,8,9,10,11,12,12-hexahydro-)	25401-40-5	**	8.13 ± 0.03 (V)	PE	4391

Ion	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$\text{C}_{19}\text{H}_{18}\text{O}^+$	$\text{C}_{15}\text{H}_8\text{O}(\text{CH}_2\text{CH}_3)_2$ (8H-Cyclohepta[b]naphthalen-8-one,7,9-diethyl-)	55027-92-4	**	7.83 ± 0.03 (V)	PE	4391
$\text{C}_{19}\text{H}_{20}\text{O}^+$	$\text{C}_6\text{H}_7(=\text{O})(\text{CH}_3)(\text{C}_6\text{H}_5)_2$ (Cyclohexanone, 2-methyl-5,5-diphenyl-)	50592-49-9	**	8.8 ± 0.2	EI	4074
$\text{C}_{19}\text{H}_{22}\text{O}^+$	$\text{C}_6\text{H}_6(\text{OH})(\text{CH}_3)(\text{C}_6\text{H}_5)_2$ (Cyclohexanol, 1-methyl-4,4-diphenyl-)	50592-47-7	**	9.2 ± 0.2	EI	4074
$\text{C}_{20}\text{H}_{24}\text{O}^+$	$\text{C}_{20}\text{H}_{24}\text{O}$ (6,16-Methanobenzocyclopentadecen-18-one,8,9,10,11,12,13,14,15-octahydro-)	25401-41-6	**	8.10 ± 0.03 (V)	PE	4391
$\text{C}_{21}\text{H}_{22}\text{O}^+$	$\text{C}_{15}\text{H}_8\text{O}(\text{CH}(\text{CH}_3)_2)_2$ (8H-Cyclohepta[b]naphthalen-8-one,7,9-bis(1-methylethyl-)	55027-93-5	**	7.76 ± 0.03 (V)	PE	4391
$\text{C}_{22}\text{H}_{18}\text{O}^+$	$\text{C}_{14}\text{H}_8(\text{CH}_2\text{CH}_2)_2\text{C}_4\text{H}_2\text{O}$ (9,10-(Ethano[2,5]furanoethano)anthracene)	34721-69-2	**	6.87 (V)	PE	5575
$\text{C}_{23}\text{H}_{24}\text{O}^+$	$\text{C}_{10}\text{H}_{11}(=\text{O})(\text{CH}_3)(\text{C}_6\text{H}_5)_2$ (2(3H-Naphthalenone, 4,4a,5,6,7,8-hexahydro-4a-methyl-7,7-diphenyl-)	50786-03-3	**	8.9 ± 0.2	EI	4074
$\text{C}_{23}\text{H}_{30}\text{O}^+$	$\text{C}_{23}\text{H}_{30}\text{O}$ (6,19-Methanobenzocyclooctadecen-21-one, 7,8,9,10,11,12,13,14,15,16,17,18,-dodecahydro-)	25401-43-8	**	8.15 ± 0.03 (V)	PE	4391
CHO_2^+	HCOOH	64-18-6		12.26	PI	4959
			H	12.29 ± 0.03	PI	4177
			H	12.36 ± 0.1	PI	5135
	$((\text{CH}_3)_2\text{C}(\text{NO})\text{OOCCH}_3)_2$	68777-98-0		12.75	EI	4809
CH_2O_2^+	HCOOH	64-18-6	**	11.329 ± 0.002	S	5465
			**	11.05 ± 0.03	PI	3765
			**	11.16 ± 0.03	PI	4177
			**	11.314 ± 0.002	PI	4306
			**	10.7 (V)	PE	4467
			**	11.3	PE	3883
			**	11.33	PE	3874
			**	11.34 (V)	PE	4850
			**	11.35 ± 0.03	PE	3734
			**	11.51 (V)	PE	4513
CH_3O_2^+	HCOOC ₂ H ₅	109-94-4	$\text{CH}_2=\text{CH}$	10.9 ± 0.05	EI	4831
	HCOOCH ₂ CH ₂ CH ₃	110-74-7	$\text{CH}_2=\text{CHCH}_2$	10.45 ± 0.05	EI	4831
	HCOOCH(CH ₃) ₂	625-55-8	$\text{CH}_2=\text{CHCH}_3$	10.38 ± 0.05	EI	4831
$\text{C}_2\text{H}_2\text{O}_2^+$	(CHO) ₂	107-22-2	**	10.52 (V)	PE	5517
	$((\text{CH}_3)_2\text{C}(\text{NO})\text{OOCCH}_3)_2$	68777-98-0		10.30	EI	4809
$\text{C}_2\text{H}_3\text{O}_2^+$	$((\text{CH}_3)_2\text{C}(\text{NO})\text{COOCH}_3)_2$	6144-15-6		11.05	EI	4809
	$((\text{CH}_3)_2\text{C}(\text{NO})\text{OOCCH}_3)_2$	68777-98-0		10.35	EI	4809

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_2H_4O_2^+$	CH ₃ COOH	64-19-7	**	10.38±0.03	PI	3765
			**	10.644±0.002	PI	4306
			**	10.66±0.05	PI	4959
			**	10.664±0.003	PI	5161
			**	10.63 (V)	PE	4850
			**	10.65	PE	3874
			**	10.69±0.03	PE	3734
			**	10.70	PE	3718
			**	10.8 (V)	PE	4426
			**	10.84 (V)	PE	5251
			**	10.87 (V)	PE	4513
			**	11.5 (V)	PE	4467
	HCOOCH ₃	107-31-3	**	10.66±0.05	EI	5263
			**	10.66	EI	5039
			**	10.3 (V)	PE	4467
			**	10.85±0.05	PE	4831
			**	10.85	PE	3718
	CH ₃ CH ₂ CH ₂ COOH	107-92-6	**	10.85 (V)	PE	4850
			C ₂ H ₄	10.60±0.05	EI	5263
			C ₂ H ₄	10.60	EI	5039
	CH ₃ (CH ₂) ₃ COOH	109-52-4	C ₃ H ₆	10.56±0.05	EI	5263
			C ₃ H ₆	10.56	EI	5039
	CH ₃ (CH ₂) ₄ COOH	142-62-1	C ₄ H ₈	10.52±0.05	EI	5263
			1-C ₄ H ₈	10.52	EI	5039
	CH ₃ (CH ₂) ₅ COOH	111-14-8	C ₅ H ₁₀	10.54±0.05	EI	5263
			1-C ₅ H ₁₀	10.54	EI	5039
	((CH ₃) ₂ C(NO)OOCCH ₃) ₂	68777-98-0		11.35	EI	4809
$C_2H_5O_2^+$	CH ₃ COOC ₂ H ₅	141-78-6	CH ₂ =CH	10.6±0.1	EI	4831
	CH ₃ COOCH(CH ₃) ₂	108-21-4	CH ₂ =CHCH ₂	9.96±0.05	EI	4831
	CH ₃ COOCH ₂ CH ₂ CH ₃	109-60-4	CH ₂ =CHCH ₂	9.94±0.05	EI	4831
$C_2H_6O_2^+$	(CH ₃ O) ₂	690-02-8	**	9.71 (V)	PE	5068
$C_3H_4O_2^+$	CH ₂ =CHCOOH	79-10-7	**	10.60	PE	3864
$C_3H_6O_2^+$	C ₂ H ₅ COOH	79-09-4	**	10.525±0.003	PI	5161
			**	10.44±0.03	PE	3734
			**	10.51 (V)	PE	4850
			**	10.54	PE	3874
			**	10.72 (V)	PE	4513
			**	10.41	EI	5039
			**	10.25±0.05	PE	4831
			**	10.25 (V)	PE	4850
	CH ₃ COOCH ₃	79-20-9	**	10.33	PE	3718
			**	10.59 (V)	PE	3937
			**	11.0 (V)	PE	4467
			**	10.61±0.05	PE	4831
			**	10.61 (V)	PE	4850
			**	10.62	PE	3718
			**	9.86 (V)	PE	5212
	C ₃ H ₆ O ₂ (1,2-Dioxolane)	4362-13-4	**			
			**			
	C ₃ H ₆ O ₂ (1,3-Dioxolane)	646-06-0	**	10.1 (V)	PE	3733
	<i>n</i> -C ₃ H ₇ COOCH ₃	623-42-7		10.17±0.05	EI	5070
			C ₂ H ₄	10.18	EI	5039
	<i>sec</i> -C ₄ H ₉ COOH	116-53-0	C ₂ H ₄	10.27	EI	5039
			C ₃ H ₆	10.20	EI	5039
	CH ₃ CH(CH ₃)CH(CH ₃)COOH	14287-61-7	C ₃ H ₆	10.06	EI	5039
			C ₃ H ₆	10.06	EI	5039
	<i>n</i> -C ₄ H ₉ COOCH ₃	624-24-8	C ₃ H ₆	10.06	EI	5039
			C ₃ H ₆	10.16	EI	5039
	<i>iso</i> -C ₄ H ₉ COOCH ₃	556-24-1	C ₃ H ₆	10.16	EI	5039
			C ₃ H ₆	10.16	EI	5039

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_4H_2O_2^+$	$C_4H_2(=O)_2$ (3-Cyclobutene-1,2-dione)	32936-74-6	**	9.79 (V)	PE	4808
	$C_6H_4O_2$ (2,5-Cyclohexadiene-1,4-dione)	106-51-4	C_2H_2	11.2 ± 0.05	PI	3523
$C_4H_4O_2^+$	$C_4H_4(=O)_2$ (1,2-Cyclobutanedione)	33689-28-0	**	9.61 (V)	PE	4808
	$C_4H_4O_2$ (1,4-Dioxin)	290-67-5	**	7.75 ± 0.02	PE	4740
	$C_4H_4O(=O)$ (2(3H)-Furanone)	20825-71-2	**	10.70 (V)	PE	3826
$C_4H_6O_2^+$	$CH_2=CHCOOCH_3$	96-33-3	**	10.72 (V)	PE	3937
	$CH_3CO_2CH=CH_2$	108-05-4	**	9.85 ± 0.05 (V)	PE	4859
	$(CH_3CO)_2$	431-03-8	**	9.47 (V)	PE	5538
			**	9.55 (V)	PE	3936
			**	9.55 (V)	PE	4520
			**	9.57 (V)	PE	4233
			**	9.72 (V)	PE	5517
	$CH_2=CHCH_2COOH$	625-38-7	**	10.02	PE	5086
	$CH_2=C(CH_3)COOH$	3724-65-0	**	10.15	PE	5086
	<i>cis</i> - $CH_3CH=CHCOOH$	503-64-0	**	10.08	PE	5086
	<i>trans</i> - $CH_3CH=CHCOOH$	107-93-7	**	10.08	PE	5086
	C_3H_5COOH (Cyclopropanecarboxylic acid)	1759-53-1	**	10.64	PE	5086
	$C_4H_6O_2$ (1,2-Dioxin-3,6-dihydro-)	18715-02-1	**	9.66	PE	5318
	$C_4H_6O_2$ (1,4-Dioxin, 2,3-dihydro-)	543-75-9	**	8.07 ± 0.02	PE	4740
	$C_4H_6O(=O)$ (2(3H)-Furanone, dihydro-)	96-48-0	**	10.26 (V)	PE	4742
			**	10.26 (V)	PE	3826
	$HCOOCH_2CH_2CH_3$	110-74-7	**	10.50 ± 0.05	PE	4831
			**	10.50	PE	4850
			**	10.62	PE	3718
	$CH_3COOC_2H_5$	141-78-6	**	9.90 ± 0.05	PE	4831
			**	9.90 (V)	PE	4850
			**	10.24	PE	3718
			**	10.16	EI	5039
	$C_2H_5COOCH_3$	554-12-1	**	10.30 (V)	PE	4850
			**	10.15	EI	5039
	$HCOOCH(CH_3)_2$	625-55-8	**	10.44 ± 0.05	PE	4831
			**	10.44 (V)	PE	4850
	<i>n</i> - C_3H_7COOH	107-92-6	**	10.22 (V)	PE	3937
			**	10.38 (V)	PE	4850
			**	10.46	PE	3874
			**	10.24	EI	5039
	<i>iso</i> - C_3H_7COOH	79-31-2	**	10.33 ± 0.03	PE	3734
			**	10.33	PE	3874
			**	10.12	EI	5039
			**	10.329 ± 0.005	PI	5161
			**	10.30 (V)	PE	3937
	$C_4H_8O_2$ (1,2-Dioxane)	5703-46-8	**	10.0 (V)	PE	5212
	$C_4H_8O_2$ (1,3-Dioxane)	505-22-6	**	10.1 (V)	PE	3733
			**	10.12 (V)	PE	4082

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
	C ₄ H ₈ O ₂ (1,4-Dioxane)	123-91-1	**	9.41 (V)	PE	4082
			**	9.43 (V)	PE	3733
	(C ₂ H ₅) ₂ CHCOOH	88-09-5	C ₂ H ₄	10.14	EI	5039
	C ₂ H ₅ C(CH ₃) ₂ COOH	595-37-9	C ₂ H ₄	10.02	EI	5039
	<i>n</i> -C ₃ H ₇ COOC ₂ H ₅	105-54-4	C ₂ H ₄	10.06	EI	5039
	<i>sec</i> -C ₄ H ₉ COOCH ₃	868-57-5	C ₂ H ₄	9.81	EI	5039
	<i>n</i> -C ₃ H ₇ C(CH ₃) ₂ COOH	1185-39-3	C ₃ H ₆	9.96	EI	5039
	<i>n</i> -C ₃ H ₁₁ COOC ₂ H ₅	123-66-0	1-C ₄ H ₈	9.96	EI	5039
C ₄ H ₁₀ O ₂ ⁺	<i>tert</i> -C ₄ H ₉ OOH	75-91-2	**	10.24 (V)	PE	4251
C ₅ H ₃ O ₂ ⁺	C ₆ H ₅ COC ₄ H ₃ O (Methanone, 2-furanylphenyl-)	2689-59-0	C ₆ H ₅	12.4±0.1	EI	5493
C ₅ H ₄ O ₂ ⁺	C ₅ H ₄ O ₂ (4-Cyclopentene-1,3-dione)	930-60-9	**	10.25 (V)	PE	3826
	C ₄ H ₃ OCHO (2-Furancarboxaldehyde)	98-01-1	**	9.50±0.05	EI	3482
	C ₅ H ₄ O(=O) (4H-Pyran-4-one)	108-97-4	**	9.35±0.05 (V)	PE	5002
C ₅ H ₆ O ₂ ⁺	CH ₂ =C=CHCOOCH ₃	18913-35-4	**	10.02 (V)	PE	4748
	C ₅ H ₆ (=O) ₂ (1,3-Cyclopentanedione)	3859-41-4	**	9.46±0.05	PE	3848
			**	9.53 (V)	PE	5020
	C ₅ H ₅ (=O)OH (2-Cyclopenten-1-one, 3-hydroxy-)	5870-62-2	**	9.22±0.05 (V)	PE	3848
	C ₃ H ₂ O ₂ (=CH ₂) ₂ (1,3-Dioxolane, 4,5-bis(methylene)-)	4362-68-9	**	8.62	PE	5265
	C ₄ H ₃ O(=O)CH ₃ (2(3H)-Furanone, 5-methyl-)	591-12-8	**	9.62±0.05	EI	4666
	C ₄ H ₃ O(=O)CH ₃ (2(5H)-Furanone, 5-methyl-)	591-11-7	**	10.12±0.05	EI	4666
C ₅ H ₈ O ₂ ⁺	CH ₂ =C(CH ₃)COOCH ₃	80-62-6	**	10.28 (V)	PE	3937
	CH ₃ COCH ₂ COCH ₃	123-54-6	**	8.85±0.05	PE	3848
			**	9.00 (V)	PE	4195
			**	9.15 (V)	PE	5100
			**	9.18±0.07 (V)	PE	3682
	(CH ₃) ₂ C=CHCOOH	541-47-9	**	9.63	PE	5086
	CH ₃ CO ₂ C(CH ₃)=CH ₂	591-87-7	**	9.74±0.05 (V)	PE	4859
	C ₂ H ₅ CH=CHCOOH	626-98-2	**	10.14	PE	5086
	HCOC(CH ₃) ₂ CHO	1185-34-8	**	9.8 (V)	PE	4195
	CH ₃ CH=CHCH ₂ COOH	1617-32-9	**	9.41	PE	5086
	CH ₂ =C(C ₂ H ₅)COOH	3586-58-1	**	10.06	PE	5086
	CH ₃ CH=C(CH ₃)COOH	13201-46-2	**	9.50	PE	5086
	CH ₂ =C(CH ₃)CH ₂ COOH	53774-20-2	**	9.52	PE	5086
	C ₄ H ₇ COOH (Cyclobutanecarboxylic acid)	3721-95-7	**	10.35	PE	5086
	C ₅ H ₈ O ₂ (2,3-Dioxabicyclo[2.2.1]heptane)	279-35-6	**	8.96 (V)	PE	5563
			**	8.99 (V)	PE	5212
C ₅ H ₉ O ₂ ⁺	((CH ₃) ₂ CO) ₂	XXXXX-XX-X CH ₃		10.08±0.05	PI	5412
	((CH ₃) ₂ C(NO)OOCCH ₃) ₂	68777-98-0		9.45	EI	4809

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_5H_{10}O_2^+$	$CH_3COOCH(CH_3)_2$	108-21-4	**	9.95 ± 0.05	PE	4831
			**	10.08	PE	3718
	$CH_3COOCH_2CH_2CH_3$	109-60-4	**	9.92 (V)	PE	4850
	$HCOO(CH_2)_3CH_3$	592-84-7	**	10.52 ± 0.05	PE	4831
			**	10.52 (V)	PE	4850
			**	10.54	PE	3718
	<i>n</i> - C_4H_9COOH	109-52-4	**	10.53 (V)	PE	3874
	<i>n</i> - $C_3H_7COOCH_3$	623-42-7	**	10.15 (V)	PE	4850
	<i>iso</i> - C_4H_9COOH	503-74-2	**	10.51 (V)	PE	3874
	<i>tert</i> - C_4H_9COOH	75-98-9	**	10.3 (V)	PE	4426
	$C_5H_{10}O_2$ (1,2-Dioxepane)	505-63-5	**	9.75 (V)	PE	5212
	$C_3H_4O_2(CH_3)_2$ (1,3-Dioxolane, 2,2-dimethyl-)	2916-31-6	**	9.71 (V)	PE	3733
$C_6H_4O_2^+$	$C_6H_4O_2$ (2,5-Cyclohexadiene-1,4-dione)	106-51-4	**	9.7	PI	3586
			**	9.96 ± 0.01	PI	3523
			**	9.96 ± 0.01	PI	5505
			**	9.99 ± 0.05 (V)	PE	5558
			**	10.01	PE	4463
			**	10.03 (V)	PE	3936
			**	10.11	PE	5082
	$C_6H_4(=O)_2$ (3,5-Cyclohexadiene-1,2-dione)	583-63-1	**	9.6 (V)	PE	4616
			**	9.60 (V)	PE	4808
$C_6H_5O_2^+$	$C_6H_4(OH)OCH_3$ (Phenol, 4-methoxy-)	150-76-5	CH_3	11.10 ± 0.1	EI	3446
	$C_6H_4(OH)OOCCH_3$ (1,2-Benzenediol monoacetate)	2848-25-1	CH_3CO	12.54 ± 0.02	EI	3631
	$C_6H_4(OH)OOCCH_3$ (1,4-Benzenediol monoacetate)	3233-32-7	CH_3CO	13.83 ± 0.02	EI	3631
	$C_6H_4(NO_2)OH$ (Phenol, 4-nitro-)	100-02-7	NO	9.90 ± 0.1	EI	3447

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_6H_6O_2^+$	$C_6H_4(OH)_2$ (1,2-Benzenediol)	120-80-9	**	8.56 (V)	PE	4891
	$C_6H_4(OH)_2$ (1,3-Benzenediol)	108-46-3	**	8.63 (V)	PE	4891
	$C_6H_6O_2$ (1,4-Benzenediol)	123-31-9	**	7.95 ± 0.03	PI	3523
			**	7.95 ± 0.05	PI	5552
			**	8.44 (V)	PE	4891
	$C_3(=O)_2(CH_3)_2$ (3-Cyclobutene-1,2-dione, 3,4-dimethyl-)	1121-15-9	**	9.06 (V)	PE	4808
			**	9.10 (V)	PE	4861
	$C_4H_3OCOCH_3$ (Ethanone, 1-(2-furanyl)-)	1192-62-7	**	9.27 ± 0.05	EI	3482
	$C_6H_4(OH)OOCH_3$ (1,2-Benzenediol monoacetate)	2848-25-1	$CH_2=C=O$	9.30 ± 0.02	EI	3631
	$C_6H_4(OH)OOCCH_3$ (Benzeneacetic acid, 4-hydroxy-)	3233-32-7	$CH_2=C=O$	9.28 ± 0.02	EI	3631
$C_6H_8O_2^+$	$C_6H_8(=O)_2$ (1,3-Cyclohexanedione)	504-02-9	**	9.52 ± 0.05	PE	3848
			**	9.60 (V)	PE	5020
	$C_6H_8(=O)_2$ (1,4-Cyclohexanedione)	637-88-7	**	9.65 (V)	PE	3936
			**	~ 9.85 (V)	PE	5090
	$C_5H_5(=O)_2CH_3$ (1,3-Cyclopentanedione, 2-methyl-)	765-69-5	**	9.40 ± 0.1 (V)	PE	3848
	$C_5H_4(=O)(OH)CH_3$ (2-Cyclopenten-1-one, 3-hydroxy-2-methyl-)	5870-63-3	**	8.84 ± 0.05	PE	3848
	$C_6H_8O_2$ (2,3-Dioxabicyclo[2.2.2]oct-5-ene)	6671-70-1	**	8.76 (V)	PE	5563
	$C_4H_4O_2(=CH_2)_2$ (1,4-Dioxane, 2,3-bis(methylene)-)	70517-24-7	**	8.38	PE	5265
	$C_4H_2O(=O)(CH_3)_2$ (3(2H)-Furanone, 2,5-dimethyl-)	14400-67-0	**	9.23 ± 0.05	EI	4673
	$C_3H_5COCOCH_3$ (1,2-Propanedione, 1-cyclopropyl-)	15940-89-3	**	9.33 (V)	PE	4233
$C_6H_{10}O_2^+$	$CH_3COC(CH_3)HCOCH_3$	815-57-6	**	8.55 (V)	PE	4195
	<i>trans</i> - $CH_3CH=CHCOOC_2H_5$	623-70-1	**	10.11 (V)	PE	3937
	$C_6H_9(=O)OH$ (Cyclohexanone, 2-hydroxy-)	533-60-8	**	9.70 (V)	PE	4509
	$C_6H_{10}O_2$ (2,3-Dioxabicyclo[2.2.2]octane)	280-53-5	**	8.82 (V)	PE	5212
			**	8.83 (V)	PE	5563
$C_6H_{11}O_2^+$	$C_4H_6O_2(CH_3)_2$ (1,3-Dioxane, 4,6-dimethyl-, <i>cis</i> -)	3390-18-9	H	9.693 ± 0.005	EI	3481
	$C_4H_6O_2(CH_3)_2$ (1,3-Dioxane, 4,6-dimethyl-, <i>trans</i> -)	1121-87-5	H	9.540 ± 0.003	EI	3481
	$C_4H_5O_2(CH_3)_3$ (1,3-Dioxane, 2,4,6-trimethyl-, (2 α ,4 α ,6 α)-)	19145-91-6	CH_3	9.593 ± 0.006	EI	3481
	$C_4H_5O_2(CH_3)_3$ (1,3-Dioxane, 2,4,6-trimethyl-, (2 α ,4 α ,6 β)-)	36402-73-0	CH_3	9.448 ± 0.002	EI	3481

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₆H₁₂O₂⁺	((CH ₃) ₂ CO) ₂	XXXXX-XX-X **		9.26±0.03	PI	5412
	CH ₃ COOCH(CH ₃)C ₂ H ₅	105-46-4	**	9.97±0.05	PE	4831
	C ₂ H ₅ COOCH ₂ CH ₂ CH ₃	106-36-5	**	9.96 (V)	PE	4850
	CH ₃ COO(CH ₂) ₃ CH ₃	123-86-4	**	9.92±0.05	PE	4831
			**	10.02±0.05	PE	4831
			**	10.17	PE	3718
	CH ₂ =C(OC ₂ H ₅) ₂	2678-54-8	**	8.3 (V)	PE	4291
	<i>tert</i> -C ₅ H ₉ COOCH ₃	598-98-1	**	9.90±0.04	PE	3851
	<i>cis</i> -C ₅ H ₈ (OH)OCH ₃	13051-91-7	**	9.80 (V)	PE	4450
	(Cyclopentanol, 2-methoxy-, <i>cis</i> -)					
	<i>trans</i> -C ₅ H ₈ (OH)OCH ₃	7429-45-0	**	9.60 (V)	PE	4450
	(Cyclopentanol, 2-methoxy-, <i>trans</i> -)					
	C ₂ O ₂ (CH ₃) ₄	35856-82-7	**	8.53	PE	4577
	(1,2-Dioxetane, 3,3,4,4-tetramethyl-)					
	C ₆ H ₁₂ O ₂	6572-89-0	**	9.29 (V)	PE	5212
	(1,2-Dioxocane)					
C₆D₁₂O₂⁺	((CD ₃) ₂ CO) ₂	XXXXX-XX-X **		9.25±0.03	PI	5412
C₆H₁₄O₂⁺	<i>iso</i> -C ₃ H ₇ O) ₂	16642-57-2	**	9.16 (V)	PE	5212
C₇H₅O₂⁺	C ₆ H ₄ (OH)COOH (Benzoic acid, 3-hydroxy-)	99-06-9	OH	12.51±0.2	EI	3973
	C ₆ H ₄ (OH)COOH (Benzoic acid, 4-hydroxy-)	99-96-7	OH	12.00±0.2	EI	3973
	C ₆ H ₄ (COOH) ₂ (1,3-Benzenedicarboxylic acid)	121-91-5	COOH	12.42±0.2	EI	3973
	C ₆ H ₄ (COOH) ₂ (1,4-Benzenedicarboxylic acid)	100-21-0	COOH	12.56±0.2	EI	3973
C₇H₆O₂⁺	C ₆ H ₄ (O ₂ CH ₂) (1,3-Benzodioxole)	274-09-9	**	8.21 (V)	PE	5567
	C ₆ H ₅ COOH (Benzoic acid)	65-85-0	**	9.75±0.2	EI	3973
			**	9.75	EI	3792
	C ₇ H ₆ O ₂ (Bicyclo[2.2.1]hept-5-ene-2,3-dione)	17994-26-2	**	8.73±0.05 (V)	PE	4851
	C ₇ H ₆ O ₂ (2,5-Cyclohexadiene-1,4-dione, 2-methyl-)	553-97-9	**	9.78±0.02	PI	3523
			**	9.78	PE	4463
	C ₆ H ₃ (=O) ₂ (CH ₃) (3,5-Cyclohexadiene-1,2-dione, 4-methyl-)	3131-54-2	**	9.40 (V)	PE	4808
C₇H₇O₂⁺	C ₆ H ₄ (OCH ₃) ₂ (Benzene, 1,3-dimethoxy-)	151-10-0	CH ₃	11.17±0.1	EI	3446
	C ₆ H ₄ (OCH ₃) ₂ (Benzene, 1,4-dimethoxy-)	150-78-7	CH ₃	10.98±0.1	EI	3446
	C ₆ H ₄ (NO ₂)OCH ₃ (Benzene, 1-methoxy-3-nitro-)	555-03-3	NO	9.39±0.1	EI	3447
	C ₆ H ₄ (NO ₂)OCH ₃ (Benzene, 1-methoxy-4-nitro-)	100-17-4	NO	10.03±0.1	EI	3447
C₇H₈O₂⁺	C ₆ H ₄ (OH)CH ₂ OH (Benzenemethanol, 2-hydroxy-)	90-01-7	**	8.58 (V)	PE	4744
	C ₇ H ₈ O ₂ (Bicyclo[2.2.1]heptane-2,3-dione)	6236-71-1	**	9.00±0.05 (V)	PE	4851

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_7H_8O_2^+$	$C_6H_4(OH)OCH_3$ (Phenol, 4-methoxy-)	150-76-5	**	7.50	EI	3845
	$C_6H_4(OCH_3)OOCCH_3$ (Phenol, 3-methoxy-, acetate)	5451-83-2	$CH_2=C=O$	8.02 ± 0.1 9.56 ± 0.2	EI EI	3446 3484
	$C_6H_4(OCH_3)OOCCH_3$ (Phenol, 4-methoxy-, acetate)	1200-06-2	$CH_2=C=O$	9.48 ± 0.2	EI	3484
$C_7H_{10}O_2^+$	$C_5H_7(OOCCH_3)$ (2-Cyclopenten-1-ol)	20657-21-0	**	9.61 ± 0.05 (V)	PE	4954
	$C_6H_7(=O)_2CH_3$ (1,3-Cyclohexanedione, 2-methyl-)	1193-55-1	**	9.37 ± 0.05	PE	3848
	$C_5H_4(=O)_2(CH_3)_2$ (1,3-Cyclopentanedione, 2,2-dimethyl-)	3883-58-7	**	9.08 ± 0.05	PE	3848
			**	9.22 (V)	PE	4742
			**	9.22 (V)	PE	4810
	$C_5H_5(=O)_2C_2H_5$ (1,3-Cyclopentanedione, 2-ethyl-)	823-36-9	**	9.35 ± 0.1 (V)	PE	3848
	$C_5H_4(=O)(OH)C_2H_5$ (2-Cyclopenten-1-one, 2-ethyl-3-hydroxy-)	5857-25-0	**	8.79 ± 0.05	PE	3848
	$C_3O_2(=CH_2)_2(CH_3)_2$ (1,3-Dioxolane, 2,2-dimethyl-4,5-bis(methylene)-)	70517-23-6	**	8.30	PE	5265
	$C_4HO(CH_3)_2OCH_3$ (Furan, 3-methoxy-2,5-dimethyl-)	57556-12-4	**	7.86 ± 0.05	EI	4673
	$C_4HO(=O)(CH_3)_3$ (2(3H)-Furanone, 3,3,5-trimethyl-)	35983-73-4	**	9.00 ± 0.05	EI	4666
	$C_4HO(=O)(CH_3)_3$ (3(2H)-Furanone, 2,2,5-trimethyl-)	1559-45-1	**	9.04 ± 0.05	EI	4673
	$C_7H_{10}O_2$ (Spiro[2,3-dioxabicyclo[2.2.1]heptane, 7,1'-cyclopropane])	XXXXXX-XX-X	**	8.87 (V)	PE	5563
$C_7H_{12}O_2^+$	$CH_3COG(CH_3)_2COCH_3$	3142-58-3	**	9.30 (V)	PE	4195
	$C_6H_9(=O)OCH_3$ (Cyclohexanone, 2-methoxy-)	17429-00-4	**	9.06 (V)	PE	4509
	$C_7H_{12}O_2$ (6,7-Dioxabicyclo[3.2.2]nonane)	283-35-2	**	8.97 (V)	PE	5212
$C_7H_{13}O_2^+$	$C_4H_4O_2(CH_3)_4$ (1,3-Dioxane, 2,2,4,6-tetramethyl-, <i>cis</i> -)	17227-17-7	CH_3	9.332 ± 0.006	EI	3481
	$C_4H_4O_2(CH_3)_4$ (1,3-Dioxane, 2,2,4,6-tetramethyl-, <i>trans</i> -)	20268-00-2	CH_3	9.128 ± 0.008	EI	3481
$C_7H_{14}O_2^+$	$C_2H_5COOCH_2CH(CH_3)_2$	540-42-1	**	9.94 (V)	PE	4850
	<i>cis</i> - $C_6H_{10}(OH)OCH_3$ (Cyclohexanol, 2-methoxy-, <i>cis</i> -)	7429-41-6	**	9.68 (V)	PE	4450
	<i>trans</i> - $C_6H_{10}(OH)OCH_3$ (Cyclohexanol, 2-methoxy-, <i>trans</i> -)	7429-40-5	**	9.69 (V)	PE	4450
	<i>cis</i> - $C_5H_8(OCH_3)_2$ (Cyclopentane, 1,2-dimethoxy-, <i>cis</i> -)	61011-51-6	**	9.29 (V)	PE	4450
	<i>trans</i> - $C_5H_8(OCH_3)_2$ (Cyclopentane, 1,2-dimethoxy-, <i>trans</i> -)	29887-56-7	**	9.39 (V)	PE	4450
	$C_3H_2O_2(CH_3)_4$ (1,2-Dioxolane, 3,3,5,5-tetramethyl-)	22431-90-9	**	9.25 (V)	PE	4251
			**	9.26 (V)	PE	4577
$C_8H_4O_2^+$	$C_6H_4(=O)_2$ (Bicyclo[4.2.0]octa-1,3,5-triene-7,8-dione)	6383-11-5	**	9.23 (V)	PE	4861

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_8H_7O_2^+$	$CH_3OC_6H_4COCH_3$ (Ethanone, 1-(4-methoxyphenyl)-)	100-06-1	CH_3	10.69 ± 0.04	EI	5059
	$C_6H_4(OCH_3)COOH$ (Benzoic acid, 3-methoxy-)	586-38-9	OH	12.51 ± 0.2	EI	3973
	$C_6H_4(OCH_3)COOH$ (Benzoic acid, 4-methoxy-)	100-09-4	OH	12.53 ± 0.2	EI	3973
$C_8H_8O_2^+$	$C_6H_5OC(=O)CH_3$ (Acetic acid, phenyl ester)	122-79-2	**	8.6 ± 0.05	PE	5608
			**	8.75 ± 0.03	EI	3483
			**	8.84 ± 0.2	EI	3484
	$C_6H_4(CHO)OCH_3$ (Benzaldehyde, 4-methoxy-)	123-11-5	**	8.43	PE	4621
	$C_6H_4(CH_3)COOH$ (Benzoic acid, 3-methyl-)	99-04-7	**	9.43 ± 0.2	EI	3973
	$C_6H_4(CH_3)COOH$ (Benzoic acid, 4-methyl-)	99-94-5	**	9.23 ± 0.2	EI	3973
	$C_6H_5COOCH_3$ (Benzoic acid, methyl ester)	93-58-3	**	9.28	PE	4621
			**	9.34 (V)	PE	4850
			**	9.40 ± 0.025	PE	3626
			**	9.35 ± 0.03	EI	3626
			**	9.35 ± 0.1	EI	3788
			**	9.49	EI	3792
	$C_8H_8O_2$ (Bicyclo[2.2.1]hept-5-ene-2,3-dione, 5-methyl-)	60526-48-9	**	8.50 ± 0.05 (V)	PE	4851
	$C_6H_2O_2(CH_3)_2$ (2,5-Cyclohexadiene-1,4-dione, 2,5-dimethyl-)	137-18-8	**	9.58	PE	4463
			**	9.60 ± 0.05 (V)	PE	5558
	$(C_6H_5COOCH_3)(CO)_3Cr$ (Chromium, tricarbonyl[(1,2,3,4,5,6- η)-methylbenzoate]-)	12125-87-0		9.31 ± 0.1	EI	3788
$C_8H_{10}O_2^+$	$C_6H_4(OCH_3)_2$ (Benzene, 1,2-dimethoxy-)	91-16-7	**	7.8 (V)	PE	4758
			**	8.17 (V)	PE	5567
	$C_6H_4(OCH_3)_2$ (Benzene, 1,3-dimethoxy-)	151-10-0	**	8.14 (V)	PE	5567
			**	8.18 (V)	PE	4758
			**	8.17 ± 0.1	EI	3446
	$C_6H_4(OCH_3)_2$ (Benzene, 1,4-dimethoxy-)	150-78-7	**	7.54	PE	4621
			**	7.83 ± 0.015 (V)	PE	4434
			**	7.90 (V)	PE	3781
			**	7.90 (V)	PE	4758
			**	7.90 (V)	PE	5403
			**	7.96 (V)	PE	5567
			**	7.45	EI	3845
			**	7.88 ± 0.1	EI	3446
	$C_8H_{10}(=O)_2$ (Bicyclo[3.2.1]octane-2,4-dione)	XXXXXX-XX-X	**	9.28 (V)	PE	5020
	$C_8H_{10}(=O)_2$ (<i>cis</i> -Bicyclo[3.3.0]octane-3,7-dione)	XXXXXX-XX-X	**	9.78 (V)	PE	5090
	$C_3H_5COCOC_3H_5$ (Ethanedione, dicyclopropyl-)	XXXXXX-XX-X	**	9.09 (V)	PE	4233
$C_8H_{12}O_2^+$	$C_8H_{12}O_2$ (<i>trans,trans</i> - $CH_3CH=CHCH=CHCOOC_2H_5$)	5941-48-0	**	8.85 (V)	PE	5010
	$C_4(=O)_2(CH_3)_4$ (1,3-Cyclobutanedione, 2,2,4,4-tetramethyl-)	933-52-8	**	8.80 (V)	PE	3936

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_8H_{12}O_2^+$	$C_4(=O)_2(CH_3)_4$	933-52-8	**	8.80 (V)	PE	5090
	$C_6H_6(=O)_2(CH_3)_2$ (1,3-Cyclohexanedione, 5,5-dimethyl-)	126-81-8	**	9.28 ± 0.05	PE	3848
	$C_6H_7(=O)OC_2H_5$ (2-Cyclohexen-1-one, 3-ethoxy-)	5323-87-5	**	8.69 ± 0.05	PE	3848
	$C_8H_{12}O_2$ (7,8-Dioxabicyclo[4.2.2]dec-9-ene)	52148-56-8	**	9.00 (V)	PE	5563
	$C_8H_{12}O_2$ (2,3-Dioxabicyclo[2.2.1]heptane, 7-[methylene(dimethyl)]-)	XXXXX-XX-X	**	8.62 (V)	PE	5563
	$C_4H_3O(=O)(tert-C_4H_9)$ (2(3H)-Furanone, 5-(1,1-dimethylethyl)-)	19918-17-3	**	9.03 ± 0.05	EI	4666
$C_8H_{14}O_2^+$	$C_8H_{14}O_2$	142-30-3	**	9.70 (V)	PE	4847
	$(C(=CH_2)OC_2H_5)_2$	55370-32-6	**	8.14	PE	5265
	$C_8H_{14}O_2$ (7,8-Dioxabicyclo[4.2.2]decane)	52965-57-8	**	9.05 (V)	PE	5212
	$C_8H_{14}O_2$ (9,10-Dioxabicyclo[3.3.2]decane)	XXXXX-XX-X	**	9.06 (V)	PE	5563
	$C_8H_{14}O_2$	XXXXX-XX-X	**	9.14 (V)	PE	5563
	$C_4H_2O(O)(CH_3)_4$ (3(2H)-Furanone, dihydro-2,2,5,5-tetramethyl-)	5455-94-7	**	9.29 ± 0.03 (V)	PE	4292
$C_8H_{16}O_2^+$	<i>cis</i> - $C_6H_{10}(OCH_3)_2$ (Cyclohexane, 1,2-dimethoxy-, <i>cis</i> -)	30363-80-5	**	9.24 (V)	PE	4450
	<i>trans</i> - $C_6H_{10}(OCH_3)_2$ (Cyclohexane, 1,2-dimethoxy-, <i>trans</i> -)	29887-60-3	**	9.31 (V)	PE	4450
	$C_4H_4O_2(CH_3)_4$ (1,2-Dioxane, 3,3,6,6-tetramethyl-)	22431-89-6	**	9.35 (V)	PE	4577
			**	9.55 (V)	PE	4251
$C_8H_{18}O_2^+$	$(tert-C_4H_9O)_2$	110-05-4	**	8.78 (V)	PE	4251
			**	8.78 (V)	PE	5212
$C_9H_6O_2^+$	$C_9H_6(=O)_2$ (1H-Indene-1,2(3H)dione)	16214-27-0	**	9.04 ± 0.05 (V)	PE	4708
	$C_9H_6(=O)_2$ (1H-Indene-1,3(2H)dione)	606-23-5	**	9.43 ± 0.05 (V)	PE	4708
$C_9H_8O_2^+$	$C_9H_8O_2$ (Spiro[bicyclo[2.2.1]hept-5-ene-7,1'-cyclopropane]-2,3-dione)	60526-40-1	**	8.50 ± 0.05 (V)	PE	4851
$C_9H_{10}O_2^+$	$C_6H_4(OCH_3)(COCH_3)$ (Ethanone, 1-(4-methoxyphenyl)-)	100-06-1	**	8.2 ± 0.1	PE	4401
			**	8.65 (V)	PE	4804
	$C_6H_4(CH_3)OOCCH_3$ (Acetic acid, 2-methylphenyl ester)	533-18-6	**	8.38 ± 0.02	EI	3631
	$C_6H_4(CH_3)OOCCH_3$ (Acetic acid, 3-methylphenyl ester)	122-46-3	**	8.98 ± 0.2	EI	3484
	$C_6H_4(CH_3)OOCCH_3$ (Acetic acid, 4-methylphenyl ester)	140-39-6	**	7.84 ± 0.02	EI	3631
			**	8.61 ± 0.2	EI	3484
	$C_9H_{10}O_2$ (Bicyclo[2.2.1]hept-5-ene-2,3-dione, 7,7-dimethyl-)	60526-42-3	**	8.50 ± 0.05	PE	4851
	$C_9H_{10}O_2$ (Spiro[bicyclo[2.2.1]heptane-7,1'-cyclopropane]-2,3-dione)	70705-73-6	**	8.75 ± 0.05 (V)	PE	4851

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_9H_{12}O_2^+$	$C_6H_4(OCH_3)(OC_2H_5)$ (Benzene, 1-ethoxy-4-methoxy-)	5076-72-2	**	7.72 ± 0.015 (V)	PE	4434
	$C_6H_3(OCH_3)_2CH_3$ (Benzene, 1,2-dimethoxy-4-methyl-)	494-99-5	**	7.95 (V)	PE	4672
	$C_6H_5O(CH_2)_2OCH_3$ (Benzene,(2-methoxyethoxy)-)	41532-81-4	**	8.41 ± 0.05	EI	5484
	$C_9H_{12}(=O)_2$ (Bicyclo[3.2.2]nonane-2,4-dione)	XXXXX-XX-X	**	9.15 (V)	PE	5020
$C_9H_{14}O_2^+$	$C_6H_7(=O)_2CH(CH_3)_2$ (1,3-Cyclohexanedione, 2-(1-methylethyl)-)	3401-01-2	**	9.09 ± 0.05	PE	3848
	$C_6H_5(=O)_2(CH_3)_3$ (1,3-Cyclohexanedione, 2,5,5-trimethyl-)	1125-11-7	**	9.10 ± 0.05	PE	3848
	$C_5H_2(=O)_2(CH_3)_4$ (1,3-Cyclopentanedione, 4,4,5,5-tetramethyl-)	XXXXX-XX-X	**	9.18 (V)	PE	5020
$C_{10}H_6O_2^+$	$C_{10}H_6O_2$ (1,4-Naphthalenedione)	130-15-4	**	9.56 ± 0.01	PI	3523
			**	9.49	PE	5082
$C_{10}H_8O_2^+$	$C_{10}H_8(OH)_2$ (1,4-Naphthalenediol)	571-60-8	**	7.62 ± 0.03	PI	5552
$C_{10}H_{10}O_2^+$	$C_{10}H_{10}O_2$ (Bicyclo[2.2.1]hept-5-ene-2,3-dione, 7-(1-methylethylidene)-)	60526-38-7	**	8.30 ± 0.05 (V)	PE	4851
$C_{10}H_{12}O_2^+$	$C_{10}H_{12}O_2$ (2,5-Cyclohexadione-1,4-dione, 2,3,5,6-tetramethyl-)	527-17-3	**	9.16 ± 0.03	PI	3523
			**	9.16 ± 0.03	PI	5505
			**	9.25 ± 0.05 (V)	PE	5558
	$C_{10}H_{12}O_2$ (Tricyclo[3.3.1.1 ^{3,7}]decane-2,6-dione)	39751-07-0	**	9.06	PE	3886
	(JC-Mean value of Jahn-Teller components)		**	9.07 (V)	PE	5043
	$C_{10}H_{12}(=O)_2$ (Tricyclo[4.2.1.1 ^{2,6}]decane-7,8-dione)	XXXXX-XX-X	**	8.84 (V)	PE	5043
$C_{10}H_{14}O_2^+$	$C_6H_4(OCH_3)(OCH(CH_3)_2)$ (Benzene, 1-methoxy-4-(1-methylethoxy)-)	20744-02-9	**	7.83 ± 0.015 (V)	PE	4434
	$C_6H_4(OCH_3)(OC_3H_7)$ (Benzene, 1-methoxy-4-propoxy-)	20743-94-6	**	7.80 ± 0.015 (V)	PE	4434
	$C_6(CH_3)_4(OH)_2$ (1,4-Benzenediol,2,3,5,6-tetramethyl-)	527-18-14	**	7.48 ± 0.05	PI	5552
	$C_6H_5O(CH_2)_3OCH_3$ (Benzene,(3-methoxypropoxy)-)	61372-56-3	**	8.42 ± 0.05	EI	5484
	$C_7H_5(CH_3)_3O_2$ (Bicyclo[2.2.1]heptane-2,3-dione, 1,7,7-trimethyl-)	465-29-2	**	8.71 (V)	PE	5517
			**	8.80 (V)	PE	3936
	$C_8H_{11}OOCCH_3$ (Tricyclo[3.2.1.0 ^{2,4}]octan-8-ol, acetate, <i>endo-syn</i> -)	32426-26-9	**	8.6 ± 0.1	EI	3492
	$C_8H_{11}OOCCH_3$ (Tricyclo[3.2.1.0 ^{2,4}]octan-8-ol, acetate, <i>endo-anti</i> -)	32350-51-9	**	9.0 ± 0.1	EI	3492
	$C_8H_{11}OOCCH_3$ (Tricyclo[3.2.1.0 ^{2,4}]octan-8-ol, acetate, <i>exo-syn</i> -)	32350-52-0	**	8.9 ± 0.1	EI	3492
	$C_8H_{11}OOCCH_3$ (Tricyclo[3.2.1.0 ^{2,4}]octan-8-ol, acetate, <i>exo-anti</i> -)	32350-50-8	**	9.3 ± 0.1	EI	3492

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{10}H_{14}O_2^+$	$C_8H_8(OCH_3)_2$ (Tricyclo[3.2.1.0 ^{2,4}]oct-6-ene, 8,8-dimethoxy-, (1 α ,2 α ,4 α ,5 α)-)	14224-84-1	**	8.6 \pm 0.1	EI	3492
$C_{10}H_{16}O_2^+$	$C_8H_{10}(OCH_3)_2$ (Bicyclo[2.2.2]oct-2-ene, 1,4-dimethoxy-) $C_6H_7(=O)_2C(CH_3)_3$ (1,3-Cyclohexanedione, 2-(1,1-dimethylethyl)-) $C_6H_4(=O)_2(CH_3)_4$ (1,3-Cyclohexanedione, 2,2,5,5-tetramethyl-) $C_6H_4(=O)_2(CH_3)_4$ (1,3-Cyclohexanedione, 4,4,6,6-tetramethyl-) $C_6H_6O_2CH_3CH(CH_3)_2$ (2,3-Dioxabicyclo[2.2.2]oct-5-ene, 1-methyl-4-(1-methylethyl)-) $C_8H_{10}(OCH_3)_2$ (Tricyclo[3.2.1.0 ^{2,4}]octane, 8,8-dimethoxy-, (1 α ,2 α ,4 α ,5 α)-) $C_8H_{10}(OCH_3)_2$ (Tricyclo[3.2.1.0 ^{2,4}]octane, 8,8-dimethoxy-, (1 α ,2 β ,4 β ,5 α)-)	59880-82-9	**	9.24 (V)	PE	4619
		XXXXX-XX-X	**	9.05 \pm 0.1	PE	3848
		702-50-1	**	9.04 \pm 0.05	PE	3848
		60681-10-9	**	9.29 (V)	PE	5020
		512-85-6	**	8.07	PE	4577
			**	8.42 (V)	PE	4619
		14224-85-2	**	8.7 \pm 0.1	EI	3492
		7076-82-6	**	8.9 \pm 0.1	EI	3492
$C_{10}H_{18}O_2^+$	$C_8H_{12}(OCH_3)_2$ (Bicyclo[2.2.2]octane, 1,4-dimethoxy-) $C_6H_6O_2CH_3CH(CH_3)_2$ (2,3-Dioxabicyclo[2.2.2]octane, 1-methyl-4-(1-methylethyl)-)	59880-84-1	**	9.14 (V)	PE	4619
		5718-73-0	**	8.09	PE	4577
			**	8.50 (V)	PE	4619
$C_{11}H_8O_2^+$	$C_6H_5COC_4H_3O$ (Methanone,2-furanylphenyl-) $C_{10}H_5(=O)_2(CH_3)$ (1,4-Naphthalenedione,2-methyl-)	2689-59-0	**	9.1 \pm 0.1	EI	5493
		58-27-5	**	9.51 (V)	PE	5093
$C_{11}H_{10}O_2^+$	$C_6H_4C_3(CH_3)_2O_2$ (1H-Indene-1,2(3H)-dione,3,3-dimethyl-)	20651-88-1	**	8.7 (V)	PE	5517
$C_{11}H_{12}O_2^+$	$C_{11}H_{12}O_2$ (Spiro[bicyclo[2.2.1]hept-5-ene-7,1'-cyclopentane]-2,3-dione)	60526-44-5	**	8.45 \pm 0.05 (V)	PE	4851
$C_{11}H_{14}O_2^+$	$C_6H_4(OCH_3)(OCH_2C_3H_5)$ (Benzene, 1-(cyclopropylmethoxy)-4-methoxy-)	54929-10-1	**	7.78 \pm 0.015 (V)	PE	4434
$C_{11}H_{16}O_2^+$	$C_6H_4(OCH_3)(OC_4H_9)$ (Benzene, 1-butoxy-4-methoxy-) $C_6H_4(OCH_3)(OC(CH_3)_3)$ (Benzene, 1-(1,1-dimethylethoxy)-4-methoxy-) $C_6H_4(OCH_3)(OC_4H_9)$ (Benzene, 1-methoxy-4-(1-methylpropoxy)-) $C_6H_4(OCH_3)(OC_4H_9)$ (Benzene, 1-methoxy-4-(2-methylpropoxy)-) $C_6H_5O(CH_2)_4OCH_3$ (Benzene,(4-methoxybutoxy)-) $C_8H_7(=O)_2(CH_3)_3$ (Bicyclo[3.2.1]octane-2,4-dione, 1,8,8-trimethyl-) $C_{10}H_{15}COOH$ (Tricyclo[3.3.1.1 ^{3,7}]decane-1-carboxylic acid)	20743-95-7	**	7.74 \pm 0.015 (V)	PE	4434
		15360-00-6	**	8.00 \pm 0.015 (V)	PE	4434
		51241-49-7	**	7.83 \pm 0.015 (V)	PE	4434
		54929-09-8	**	7.79 \pm 0.015 (V)	PE	4434
		20636-14-0	**	8.45 \pm 0.05	EI	5484
		3278-94-2	**	8.73 (V)	PE	5020
		828-51-3	**	9.34	PE	3886

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{11}H_{18}O_2^+$	$C_7H_6(=O)_2(CH_3)_4$ (1,2-Cycloheptanedione, 3,3,7,7-tetramethyl-)	68347-39-7	**	8.70 (V)	PE	5090
	$C_7H_6O_4(CH_3)_2C_3H_7$ (2,4-Dioxabicyclo[3.2.2]non-6-ene, 1-methyl-5-(1-methylethyl)-)	59880-80-7	**	9.31 (V)	PE	4619
$C_{11}H_{20}O_2^+$	$(CH_3)_3CCOCH_2COC(CH_3)_3$	1118-71-4	**	8.86 ± 0.07 (V)	PE	3682
	$C_7H_{10}O_2(CH_3)_2C_3H_7$ (2,4-Dioxabicyclo[3.2.2]nonane, 1-methyl-5-(1-methylethyl)-)	59880-83-0	**	9.29 (V)	PE	4619
$C_{12}H_6O_2^+$	$C_{12}H_6(=O)_2$ (1,2-Acenaphthalenedione)	82-86-0	**	8.77 ± 0.05 (V)	PE	5095
$C_{12}H_8O_2^+$	$C_{12}H_8O_2$ (Dibenzo[<i>b,e</i>][1,4]dioxin)	262-12-4	**	7.78 ± 0.05 (V)	PE	4743
$C_{12}H_{12}O_2^+$	$(C_4H_2OCH_2CH_2)_2$ (13,14-Dioxatricyclo[8.2.1.1 ^{4,7}]tetradeca-4,6,10,12-tetraene)	73650-68-7	**	7.60	PE	5575
	$C_{12}H_{12}O_2$ (4a,8a-Ethanonaphthalene-9,10-dione, 1,4,5,8-tetrahydro-)	21377-44-6	**	8.70 ± 0.05 (V)	PE	4593
$C_{12}H_{14}O_2^+$	$C_{12}H_{14}O_2$ (4a,8a-Ethanonaphthalene-9,10-dione, 1,2,3,4,5,8-hexahydro-)	21377-45-7	**	8.60 ± 0.05 (V)	PE	4593
$C_{12}H_{16}O_2^+$	$C_{12}H_{16}O_2$ (4a,8a-Ethanonaphthalene-9,10-dione, octahydro-)	21377-46-8	**	8.65 ± 0.05 (V)	PE	4593
$C_{12}H_{18}O_2^+$	$C_6H_5O(CH_2)_5OCH_3$ (Benzene,[(5-methoxypentyl)oxy]-)	61372-57-4	**	8.51 ± 0.05	EI	5484
	$C_{10}H_{15}COOCH_3$ (Tricyclo[3.3.1.1 ^{3,7}]decane-1-carboxylic acid methyl ester)	711-01-3	**	9.38 ± 0.03	PE	3851
$C_{12}H_{22}O_2^+$	$C_6H_6CH_3(OCH_3)_2C_3H_7$ (Cyclohexene, 3,6-dimethoxy-3-methyl-6-(1-methylethyl)- <i>cis</i> -)	59880-81-8	**	9.21 (V)	PE	4619
$C_{12}H_{24}O_2^+$	$C_6H_8CH_3(OCH_3)_2C_3H_7$ (Cyclohexane, 1,4-dimethoxy-1-methyl-4-(1-methylethyl)- <i>cis</i> -)	59922-36-0	**	9.26 (V)	PE	4619
$C_{13}H_8O_2^+$	$C_{13}H_7(=O)OH$ (1H-Phenalen-1-one, 9-hydroxy-)	7465-58-9	**	8.12 ± 0.04 (V)	PE	5193
	$C_{14}H_8O_2$ (9H-Xanthen-9-one)	90-47-1	**	8.42 ± 0.03	PI	3523
$C_{13}H_{10}O_2^+$	$C_6H_5COOC_6H_5$ (Benzoic acid, phenyl ester)	93-99-2	**	9.0	EI	5631
	$C_6H_5COC_6H_4OH$ (Methanone, (4-hydroxyphenyl)phenyl-)	1137-42-4	**	8.80 ± 0.05 (V)	PE	4844
$C_{13}H_{12}O_2^+$	$C_6H_5CH_2OC_6H_4OH$ (Phenol, 4-(phenylmethoxy)-)	103-16-2	**	7.83	CTS	5336

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{13}H_{14}O_2^+$	$C_{11}H_8(OCH_3)_2$ (1,4-Methanonaphthalene, 1,4-dihydro-5,8-dimethoxy-)	947-58-0	**	7.77 ± 0.05 (V)	PE	5019
$C_{13}H_{20}O_2^+$	$C_6H_5O(CH_2)_6OCH_3$ (Benzene, [(6-methoxyhexyl)oxy]-)	61372-58-5	**	8.48 ± 0.05	EI	5484
$C_{14}H_8O_2^+$	$C_{14}H_8O_2$ (1,4-Anthracenedione)	635-12-1	**	8.45 ± 0.02	PI	3523
	$C_{14}H_8O_2$ (9,10-Anthracenedione)	84-65-1	**	9.25 ± 0.03	PI	3523
			**	9.3	PI	3586
			**	9.25	PE	5082
			**	9.40 ± 0.08	EI	3571
	$C_{14}H_8O_2$ (9,10-Phenanthrenedione)	84-11-7	**	8.64 ± 0.03	PI	3523
$C_{14}H_9O_2^+$	$(C_6H_5)_2CH_2OC(=O)$ (Dibenz[<i>b,e</i>]oxepin-11(6H)-one)	4504-87-4	H	10.8	EI	5340
$C_{14}H_{10}O_2^+$	$(C_6H_5)_2CH_2OC(=O)$ (Dibenz[<i>b,e</i>]oxepin-11(6H)-one)	4504-87-4	**	9.63	EI	5340
	$(C_6H_5CO)_2$ (Ethanedione, diphenyl-)	134-81-6	**	8.9 ± 0.05 (V)	PE	4844
			**	9.1 (V)	PE	5517
			**	8.86 ± 0.15	EI	3823
	$C_{13}H_7(=O)OCH_3$ (1H-Phenalen-1-one, 9-methoxy-)	35897-82-6	**	8.14 ± 0.04 (V)	PE	5193
$C_{14}H_{12}O_2^+$	$C_{14}H_{12}O_2$ (Azulene, 1,3-diacetyl-)	10487-55-5	**	7.95 (V)	PE	5397
	$C_{14}H_{12}O_2$ (3,6-Ethanodicyclopenta[<i>cd,gh</i>]pentalene-7,8-dione 2a,3,3a,5a,6,6a,6b,6c-octahydro-)	68217-17-4	**	8.85 (V)	PE	4849
	$C_{14}H_{10}(OH)_2$ (9,10-Phenanthrenediol, 9,10-dihydro- <i>trans</i> -)	572-41-8	**	8.13 (V)	PE	5364
$C_{14}H_{14}O_2^+$	$C_{11}H_9(COOC_2H_5)$ (1,4-Methanonaphthalene-6-carboxylic acid ethyl ester, 1,4-dihydro-)	56136-20-0	**	8.51 ± 0.05 (V)	PE	5019
	$C_6H_5O(CH_2)_2OC_6H_5$ (Benzene, 1,1'-[1,2-ethanediylbis(oxy)]bis-)	104-66-5	**	8.39 ± 0.05	EI	5484
	$C_6H_5CH_2OC_6H_4OCH_3$ (Benzene, 1-methoxy-4-(phenylmethoxy)-)	6630-18-8	**	7.76	CTS	5336
	$C_{14}H_{14}O_2$ (3,6-Ethanodicyclopenta[<i>cd,gh</i>]pentalene-7,8-dione, 1,2,2a,3,3a,5a,6,6a 6b,6c-decahydro-)	68217-18-5	**	8.80 (V)	PE	4849
$C_{14}H_{16}O_2^+$	$C_{14}H_{16}O_2$ (3,6-Ethanodicyclopenta[<i>cd,gh</i>]pentalene-7,8-dione, dodecahydro-)	68217-19-6	**	8.82 (V)	PE	4849
$C_{14}H_{18}O_2^+$	$C_6H_4OCH_3(OCH(C_3H_5)_2)$ (Benzene, 1-(dicyclopropylmethoxy)-4-methoxy-)	54929-11-2	**	7.80 ± 0.015 (V)	PE	4434

Ion	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{14}H_{20}O_2^+$	$C_6H_2(=O)_2(tert-C_4H_9)_2$ (3,5-Cyclohexadiene-1,2-dione, 3,5-bis(1,1-dimethylethyl)-)	3383-21-9	**	8.81 (V)	PE	4808
	$C_6H_2(=O)_2(tert-C_4H_9)_2$ (3,5-Cyclohexadiene-1,2-dione, 3,6-bis(1,1-dimethylethyl)-)	34105-76-5	**	8.71 (V)	PE	4808
$C_{14}H_{22}O_2^+$	$C_6H_4(OCH_3)(OC_7H_{15})$ (Benzene, 1-(heptyloxy)-4-methoxy-)	20743-97-9	**	7.78 ± 0.015 (V)	PE	4434
$C_{15}H_{10}O_2^+$	$C_{15}H_{10}O_2$	XXXXX-XX-X	**	9.0 (V)	PE	5599
$C_{15}H_{12}O_2^+$	$C_{15}H_{12}O_2$	XXXXX-XX-X	**	9.22 (V)	PE	5599
	$C_6H_5COCOC_6H_4CH_3$ (Ethanedione, (4-methylphenyl)phenyl-)	2431-00-7	**	9.05 ± 0.10	EI	3823
	$C_{13}H_7(=O)OC_2H_5$ (1H-Phenalen-1-one, 9-ethoxy-)	68217-42-5	**	8.06 ± 0.04 (V)	PE	5193
	$C_6H_5COCH_2COC_6H_5$ (1,3-Propanedione, 1,3-diphenyl-)	120-46-7	**	8.45 ± 0.05 (V)	PE	4844
$C_{15}H_{16}O_2^+$	$C_6H_5O(CH_2)_3OC_6H_5$ (Benzene, 1,1'-[1,3-propanediylbis(oxy)]bis-)	726-44-3	**	8.46 ± 0.05	EI	5484
$C_{16}H_{12}O_2^+$	$C_{16}H_{12}O_2$	XXXXX-XX-X	**	7.8 (V)	PE	5599
$C_{16}H_{14}O_2^+$	$C_6H_5COCH_2CH_2COC_6H_5$ (1,4-Butanedione, 1,4-diphenyl-)	495-71-6	**	9.2 ± 0.05 (V)	PE	4844
$C_{16}H_{16}O_2^+$	$C_{16}H_{16}O_2$	68217-20-9	**	8.6 (V)	PE	4849
	(2,4-Ethanobiscyclopropa[4,5]cyclopenta[1,2,3-cd:1',2',3'-gh] pentalene-5,6-dione, tetradecahydro-(1 α ,1b β ,2 α ,2a β ,2b α , 3a α ,3b β ,3c β ,3d β ,4 α ,4a β ,4b α)-)					
$C_{16}H_{18}O_2^+$	$C_6H_5O(CH_2)_4OC_6H_5$ (Benzene, 1,1'-[1,4-butanediylbis(oxy)]bis-)	3459-88-9	**	8.41 ± 0.05	EI	5484
$C_{17}H_{16}O_2^+$	$C_{17}H_{16}O_2$	XXXXX-XX-X	**	7.55 (V)	PE	5599
	$C_{13}H_7(=O)OC_4H_9$ (1H-Phenalen-1-one, 9-butoxy-)	69454-53-1	**	8.03 ± 0.04 (V)	PE	5193
	$C_6H_5COC(CH_3)_2COC_6H_5$ (1,3-Propanedione, 2,2-dimethyl-1,3-diphenyl-)	41169-42-0	**	9.0 ± 0.05 (V)	PE	4844
$C_{17}H_{18}O_2^+$	$C_{17}H_{18}O_2$	XXXXX-XX-X	**	7.5 (V)	PE	5599
	$C_{17}H_{18}O_2$	841-71-4	**	7.5 (V)	PE	5397
	(Azulene, 1,3-diacetyl-4,6,8-trimethyl-)					
$C_{17}H_{20}O_2^+$	C_6H_5O (Benzene, 1,1'-[1,5-pentanediybis(oxy)]bis-)	40339-96-6	**	8.4	EI	5484
$C_{17}H_{17}D_3O_2^+$	$C_{17}H_{17}D_3O_2$ (Benzene, 1-methoxy-3-[3-(4-methoxy- <i>d</i> ₃ -phenyl)propyl]-)	67081-97-4	**	7.90 ± 0.1	EI	4925

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{17}H_{22}O_2^+$	$C_{10}H_{15}(OCH_3)(OC_6H_4)$ (Tricyclo[3.3.1.1 ^{3,7}]decane, 1-(4-methoxyphenoxy)-)	49764-17-2	**	7.82 ± 0.015 (V)	PE	4434
$C_{18}H_{18}O_2^+$	$C_{18}H_{18}O_2$	XXXXX-XX-X	**	7.5 (V)	PE	5599
$C_{18}H_{22}O_2^+$	$C_6H_5O(CH_2)_6OC_6H_5$ (Benzene, 1,1'-[1,6-hexanediylbis(oxy)]bis-)	10125-18-5	**	8.47 ± 0.05	EI	5484
$C_{19}H_{20}O_2^+$	$C_{19}H_{20}O_2$	XXXXX-XX-X	**	7.4 (V)	PE	5599
$C_{20}H_{14}O_2^+$	$C_{20}H_{12}(OH)_2$ (Benzo[a]pyrene, 7,8-diol, 7,8-dihydro-, trans-)	57404-88-3	**	7.21 (V)	PE	5364
$C_{20}H_{22}O_2^+$	$C_{20}H_{22}O_2$ (D-Homoestra-1,3,5(10),6,8-pentaen-17a-one, 3-methoxy-)	1232-90-2	**	7.56 ± 0.07	EI	3571
	$C_{20}H_{22}O_2$ (D-Homoestra-1,3,5(10),6,8-pentaen-17a-one, 3-methoxy-, (14 β)-)	1232-91-3	**	7.82 ± 0.07	EI	3571
$C_{20}H_{26}O_2^+$	$C_{20}H_{26}O_2$ (D-Homoestra-1,3,5(10)-trien-17a-one, 3-methoxy-)	1232-89-9	**	8.22 ± 0.06	EI	3571
	$C_{20}H_{26}O_2$ (D-Homoestra-1,3,5(10)-trien-17a-one, 3-methoxy-, (8 α)-)	1232-88-8	**	8.17 ± 0.08	EI	3571
$C_{22}H_{12}O_2^+$	$C_{22}H_{12}O_2$ (6,13-Pentacenedione)	3029-32-1	**	8.07 ± 0.05	PI	3523
$C_{23}H_{40}O_2^+$	$C_6H_4(OCH_3)(OC_{16}H_{33})$ (Benzene, 1-hexadecyloxy)-4-methoxy-	20743-99-1	**	7.72 ± 0.015 (V)	PE	4434
$C_{24}H_{16}O_2^+$	$C_{24}H_{16}O_2$ (Azulene, 1,3-dibenzoyl-)	XXXXX-XX-X	**	7.7 (V)	PE	5397
$C_2H_4O_3^+$	$C_2H_4O_3$ (1,2,4-Trioxolane)	289-14-5	**	10.67 ± 0.03 (V)	PE	4980
$C_3H_2O_3^+$	$C_3H_2O_2(=O)$ (1,3-Dioxol-2-one)	872-36-6	**	10.08 (V)	PE	4549
			**	11.91 (V)	PE	3826
$C_3H_4O_3^+$	CH_3COCO_2H $C_3H_4O_2(=O)$ (1,3-Dioxolan-2-one)	127-17-3 96-49-1	**	10.42 (V)	PE	4520
			**	10.40	PE	4471
			**	10.40	PE	4648
			**	10.70	PE	4219
			**	11.1 (V)	PE	4549
			**	11.47 (V)	PE	3826

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_3H_6O_3^+$	$CH_3OCOOCH_3$	616-38-6	**	11.00 (V)	PE	4471
			**	11.00 (V)	PE	4648
			**	11.2 (V)	PE	4549
	$C_3H_6O_3$ (1,3,5-Trioxane)	110-88-3	**	10.8 (V)	PE	3733
$C_4H_2O_3^+$	$C_4H_2O(=O)_2$ (2,5-Furandione)	108-31-6	**	11.1 (V)	PE	4269
			**	11.11±0.05 (V)	PE	4708
			**	11.45 (V)	PE	3826
$C_4H_4O_3^+$	$C_4H_4O(=O)_2$ (2,5-Furandione, dihydro-)	108-30-5	**	10.8 (V)	PE	4269
			**	10.84 (V)	PE	4742
			**	10.84 (V)	PE	4810
$C_4H_6O_3^+$	$CH_3COCOOCH_3$	600-22-6	**	9.88 (V)	PE	4520
	$C_3H_3O_2(=O)CH_3$ (1,3-Dioxolan-2-one, 4-methyl-)	108-32-7		10.52	PE	4219
$C_4H_{10}O_3^+$	$CH(OCH_3)_3$	149-73-5	**	10.24±0.07 (V)	PE	4721
$C_5H_4O_3^+$	$C_3O_2(=CH_2)_2O$ (1,3-Dioxolan-2-one,4,5-bis(methylene)-)	62458-20-2	**	9.30	PE	5265
	C_4H_3OCOOH (2-Furancarboxylic acid)	488-93-7	**	9.16±0.05 (V)	PE	4626
$C_5H_6O_3^+$	$CH_3(C=O)_3CH_3$	921-11-9	**	9.52 (V)	PE	5347
	$C_3O_2(=O)(CH_3)_2$ (1,3-Dioxol-2-one, 4,5-dimethyl-)	37830-90-3	**	9.10 (V)	PE	4549
	$C_5H_6O(=O)_2$ (2H-Pyran-2,6(3H)-dione, dihydro)	108-55-4	**	11.17 (V)	PE	5090
$C_5H_8O_3^+$	$C_6H_8O_3$ (6,7,8-Trioxabicyclo[3.2.1]octane)	280-21-7	**	9.63±0.03 (V)	PE	4980
$C_6H_4O_3^+$	$C_6H_4O_3$ (7-oxabicyclo[2.2.1]hept-5-ene-2,3-dione)	55058-68-9	**	8.95±0.05 (V)	PE	4851
$C_6H_6O_3^+$	$C_4H_3OCOOCH_3$ (2-Furancarboxylic acid, methyl ester)	611-13-2	**	9.00±0.05 (V)	PE	4626
			**	9.32±0.05	EI	3482
$C_6H_{10}O_3^+$	$C_6H_{10}O_3$ (7,8,9-Trioxabicyclo[4.2.1]nonane)	284-22-0	**	9.61±0.03 (V)	PE	4980
$C_7H_6O_3^+$	$C_6H_4(OH)COOH$ (Benzoic acid, 3-hydroxy-)	99-06-9	**	9.20±0.2	EI	3973
	$C_6H_4(OH)COOH$ (Benzoic acid, 4-hydroxy-)	99-96-7	**	9.22±0.2	EI	3973

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_7H_6O_3^+$	$C_6H_4(COOH)OOCCH_3$ (Benzoic acid, 4-(acetyloxy)-)	2345-34-8	$CH_2=C=O$	10.08 ± 0.2	EI	3484
$C_8H_4O_3^+$	$C_8H_4O(=O)_2$ (2,3-Benzofurandione)	4732-72-3	**	9.65 ± 0.05 (V)	PE	4708
	$C_8H_4O(=O)_2$ (1,3-Isobenzofurandione)	85-44-9	**	10.25 ± 0.05 (V)	PE	4708
$C_8H_5O_3^+$	$C_6H_4(COOH)_2$ (1,3-Benzenedicarboxylic acid)	121-91-5	OH	12.17 ± 0.2	EI	3973
	$C_6H_4(COOH)_2$ (1,4-Benzenedicarboxylic acid)	100-21-0	OH	12.14 ± 0.2	EI	3973
$C_8H_8O_3^+$	$C_6H_4(OH))CCH_3$ (1,2-Benzenediol monoacetate)	2848-25-1	**	8.16 ± 0.02	EI	3631
	$C_6H_4(OH)OOCCH_3$ (1,4-Benzenediol monoacetate)	3233-32-7	**	8.12 ± 0.02	EI	3631
	$C_6H_4(OCH_3)COOH$ (Benzoic acid, 3-methoxy-)	586-38-9	**	9.06 ± 0.2	EI	3973
	$C_6H_4(OCH_3)COOH$ (Benzoic acid, 4-methoxy-)	100-09-4	**	9.04 ± 0.2	EI	3973
	$C_8H_8O_3$ (Bicyclo[3.2.1]octane-2,3,4-trione)	25352-00-5	**	9.49 (V)	PE	4387
$C_9H_4O_3^+$	$C_9H_4O_3$ (1H-Indene-1,2,3-trione)	938-24-9	**	9.1 (V)	PE	4387
$C_9H_7O_3^+$	$C_6H_4(COOCH_3)COSC_6H_4CH_3$ (Benzoic acid, 2-[[[(4-methylphenyl)thio]carbonyl]-methyl ester])	42797-32-0		10.98 ± 0.2	EI	4062
	$C_8H_4O(=O)(OCH_3)SC_6H_4CH_3$ (1(3H)-Isobenzofuranone, 3-methoxy-3-[(4-methylphenyl)thio]-)	51053-89-5		10.7 ± 0.2	EI	4062
$C_9H_{10}O_3^+$	$C_6H_4(OCH_3)CO_2CH_3$ (Benzoic acid, 4-methoxy-, methyl ester)	121-98-2	**	8.24	PE	4621
	$C_9H_{10}O_3$ (Bicyclo[3.2.2]nonane-2,3,4-trione)	57744-40-8	**	9.14 (V)	PE	4387
	$C_6H_4(OCH_3)OOCCH_3$ (Phenol, 3-methoxy-, acetate)	5451-83-2	**	8.29 ± 0.2	EI	3484
	$C_6H_4(OCH_3)OOCCH_3$ (Phenol, 4-methoxy-, acetate)	1200-06-2	**	7.92 ± 0.2	EI	3484
$C_9H_{12}O_3^+$	$C_5O_3(CH_3)_4$ (1,2,3 Cyclopentanetrione, 4,4,5,5-tetramethyl-)	1889-98-1	**	9.00 (V)	PE	4387
$C_9H_{18}O_3^+$	$((CH_3)_2CO)_3$	XXXXX-XX-X	**	9.10 ± 0.03	PI	5412
$C_{10}H_6O_3^+$	$C_{10}H_5O_2(OH)$ (1,4-Naphthalenedione, 5-hydroxy-)	481-39-0	**	8.70 ± 0.02	PI	3523
$C_{10}H_{14}O_3^+$	$C_6H_2O_3(CH_3)_4$ (1,2,3 Cyclohexanetrione, 4,4,6,6-tetramethyl-)	57744-39-5	**	9.10 (V)	PE	4387

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{10}H_{16}O_3^+$	$CH(OCH_2CH=CH_2)_3$	16754-50-0	**	9.80 ± 0.07 (V)	PE	4721
	$C_6H_4O(=O)_2(CH_3)_4$	XXXXX-XX-X	**	8.90 (V)	PE	5090
	(1,2-Cycloheptanedione-5-oxa,3,3,7,7-tetramethyl-)					
$C_{12}H_6O_3^+$	$C_{12}H_6O(=O)_2$	81-84-5	**	8.92 ± 0.05 (V)	PE	5095
	(1H,3H-Naphtho[1,8-cd]pyran-1,3-dione)					
$C_{12}H_{22}O_3^+$	$C_4H_4O_3(tert-C_4H_9)_2$	XXXXX-XX-X	**	9.00 (V)	PE	5563
	(2,3,7-Trioxabicyclo[2.2.1]heptane,1,4-bis(1,1-dimethylethyl)-)					
$C_{14}H_8O_3^+$	$C_{14}H_7O_2(OH)$	129-43-1	**	8.43 ± 0.05	PI	3523
	(9,10-Anthracenedione, 1-hydroxy-)					
	$C_{14}H_7O_2(OH)$	605-32-3	**	8.70 ± 0.03	PI	3523
	(9,10-Anthracenedione, 2-hydroxy-)					
$C_{14}H_{10}O_3^+$	$C_6H_5COCOC_6H_4OH$	38469-73-7	**	8.9 ± 0.05 (V)	PE	4844
	(Ethanedione, (4-hydroxyphenyl)phenyl-)					
$C_{14}H_{12}O_3^+$	$C_6H_5COOC_6H_4OCH_3$	1523-19-9	**	8.6	EI	5631
	(Phenol, 4-methoxy-, benzoate)					
$C_{18}H_{18}O_3^+$	$C_{18}H_{18}O_3^+$	71591-81-6	**	8.6 ± 0.05 (V)	PE	4844
	(1,3-Propanedione, 1-(4-methoxyphenyl)-2,2-dimethyl-3-phenyl-)					
$C_{20}H_{14}O_3^+$	$C_{20}H_{12}(OH)_2O$	60268-85-1	**	7.13 (V)	PE	5364
	(Benzo[10,11]chryseno[3,4-b]oxirene-7,8-diol,7,8,8a,9a-tetrahydro-(7 α ,8 β ,8a α ,9a α)-)					
$C_2H_2O_4^+$	HOCOCOOH	144-62-7	**	11.20 (V)	PE	4487
			**	11.20 (V)	PE	4648
			**	11.20 (V)	PE	5517
$C_2H_4O_4^+$	(HCOOH) ₂	14523-98-9	**	11.3 (V)	PE	3734
$C_3H_4O_4^+$	$CH_2(COOH)_2$	141-82-2	**	11.05 (V)	PE	5243
$C_4H_4O_4^+$	<i>trans</i> -HO ₂ CCH=CHCO ₂ H	110-17-8	**	10.9 (V)	PE	4464
$C_4H_6O_4^+$	$CHCH_3(COOH)_2$	516-05-2	**	10.80 (V)	PE	5243
	$CH_3OCOCOOCH_3$	553-90-2	**	10.30 (V)	PE	4648
$C_4H_8O_4^+$	(CH ₃ COOH) ₂	6993-75-5	**	10.6 (V)	PE	3734
$C_6H_6O_4^+$	$CH_3OCC \equiv CCOOCH_3$	762-42-5	**	10.9 (V)	PE	3937
	$C_4(=O)_2(CH_3O)_2$	5222-73-1	**	9.20 (V)	PE	4861
	(3-Cyclobutene-1,2-dione, 3,4-dimethoxy-)					

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_6H_8O_4^+$	<i>cis</i> -(CH ₃ OC(O)CH) ₂	624-48-6	** **	10.3 (V) 10.47 (V)	PE PE	4464 3937
	<i>trans</i> -(CH ₃ OC(O)CH) ₂	624-49-7	** **	10.5 (V) 10.70 (V)	PE PE	4464 3937
$C_6H_{10}O_4^+$	C ₂ H ₅ OCOCOOCC ₂ H ₅	95-92-1	**	10.19 (V)	PE	4648
$C_6H_{12}O_4^+$	(CH ₃ CH ₂ COOH) ₂	XXXXX-XX-X	**	10.4 (V)	PE	3734
$C_7H_7O_4^+$	C ₁₄ H ₂₀ O ₁₀ (α -D-Galactopyranosiduronic acid, methyl methyl ester, triacetate)	35785-35-4		10.81	EI	5227
$C_7H_{12}O_4^+$	C(C ₂ H ₅) ₂ (COOH) ₂	510-20-3	**	10.40 (V)	PE	5243
$C_8H_6O_4^+$	C ₆ H ₄ (COOH) ₂ (1,3-Benzenedicarboxylic acid)	121-91-5	**	9.98±0.2	EI	3973
	C ₆ H ₄ (COOH) ₂ (1,4-Benzenedicarboxylic acid)	100-21-0	**	9.86±0.2	EI	3973
$C_8H_{16}O_4^+$	C ₈ H ₁₆ O ₄ (1,4,7,10-Tetraoxacyclododecane)	294-93-9	**	9.3 (V)	PE	5104
$C_9H_8O_4^+$	C ₆ H ₄ (COOH)OOCCH ₃ (Benzoic acid, 4-(acetyloxy)-)	2345-34-8	**	9.11±0.2	EI	3484
$C_{10}H_6O_4^+$	C ₁₀ H ₄ O ₂ (OH) ₂ (1,4-Naphthalenedione, 5,8-dihydroxy-)	475-38-7	**	8.20±0.02	PI	3523
$C_{12}H_{24}O_4^+$	((CH ₃) ₂ CO) ₄	XXXXX-XX-X	**	9.02±0.03	PI	5412
$C_{14}H_8O_4^+$	C ₁₄ H ₆ O ₂ (OH) ₂ (9,10-Anthracenedione, 1,4-dihydroxy-)	81-64-1	**	7.94±0.03	PI	3523
	C ₁₄ H ₆ O ₂ (OH) ₂ (9,10-Anthracenedione, 1,5-dihydroxy-)	117-12-4	**	8.53±0.03	PI	3523
	C ₁₄ H ₆ O ₂ (OH) ₂ (9,10-Anthracenedione, 2,6-dihydroxy-)	84-60-6	**	8.65±0.05	PI	3523
$C_{16}H_{14}O_4^+$	C ₆ H ₄ (COOCH ₃)C ₆ H ₄ COOCH ₃ ([1,1'-Biphenyl]-2,2'-dicarboxylic acid dimethyl ester)	5807-64-7	**	8.90±0.05	EI	4199
	C ₆ H ₄ (COOCH ₃)C ₆ H ₄ COOCH ₃ ([1,1'-Biphenyl]-4-4'-dicarboxylic acid dimethyl ester)	792-74-5	**	9.15±0.05	EI	4199
	(C ₆ H ₅ CH ₂ OC=O) ₂ (Ethanedioic acid bis(phenylmethyl)ester)	7579-36-4	**	9.1 (V)	PE	4609
$C_{22}H_{10}O_4^+$	C ₂₂ H ₁₀ O ₄ (5,7,12,14-Pentacenetetrone)	23912-79-0	**	9.22±0.05	PI	3523
$C_9H_9O_5^+$	C ₁₄ H ₂₀ O ₁₀ (α -D-Galactopyranosiduronic acid, methyl methyl ester, triacetate)	35785-35-4		10.50	EI	5227

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{10}H_{20}\dot{O}_5^+$	$C_{10}H_{20}O_5$ (1,4,7,10,13-Pentaoxacyclopentadecane)	33100-27-5	**	9.58 (V)	PE	5104
$C_9H_{11}O_6^+$	$C_{14}H_{20}O_{10}$ (α -D-Galactopyranosiduronic acid, methyl methyl ester, triacetate)	35785-35-4		10.46	EI	5227
$C_{10}H_2O_6^+$	$C_{10}H_2O_2(=O)_4$ (1 <i>H</i> ,3 <i>H</i> -Benzo[1,2- <i>c</i> :4,5- <i>c'</i>]difuran-1,3,5,7-tetrone)	89-32-7	**	12.19 ± 0.02	PI	4174
$C_{12}H_{24}O_6^+$	$C_{12}H_{24}O_6$ (1,4,7,10,13,16-Hexaoxacyclooctadecane)	17455-13-9	**	9.70 (V)	PE	5104
$C_{14}H_8O_6^+$	$C_{14}H_4O_2(OH)_4$ (Anthraquinone, 1,4,5,8-tetrahydroxy-)	81-60-7	**	7.83 ± 0.02	PI	3523
$C_{20}H_{24}O_6^+$	$C_{20}H_{24}O_6$ (Dibenzo[<i>b,k</i>][1,4,7,10,13,16]hexaoxacyclooctadecin,6,7,9,10,17,18,20,21-octahydro-)	14187-32-7	**	7.70 (V)	PE	5104
$C_{20}H_{36}O_6^+$	$C_{20}H_{30}O_6$ (Dibenzo[<i>b,k</i>][1,4,7,10,13,16]hexaoxacyclooctadecin,eicosahydro-)	16069-36-6	**	9.45 (V)	PE	5104
$C_{11}H_{13}O_7^+$	$C_{14}H_{20}O_{10}$ (α -D-Galactopyranosiduronic acid, methyl methyl ester, triacetate)	35785-35-4	OCH_3, CH_3COOH	10.27	EI	5227
$C_{13}H_{17}O_9^+$	$C_{14}H_{20}O_{10}$ (α -D-Galactopyranosiduronic acid, methyl methyl ester, triacetate)	35785-35-4	OCH_3	10.10	EI	5227
$C_{11}H_{20}O_{10}^+$	$C_{14}H_{20}O_{10}$ (α -D-Galactopyranosiduronic acid, methyl methyl ester, triacetate)	35785-35-4	**	9.96	EI	5227
$BeC_{10}H_{14}O_4^+$	$(CH_3COCHCOCH_3)_2Be$ (Beryllium, bis(2,4-pentanedionato- <i>O,O'</i>)-, (<i>T</i> -4)-)	10210-64-7	**	8.41 ± 0.07 (V)	PE	3682
BCH_3O^+	$(BH_3)(CO)$	13205-44-2	**	11.14 ± 0.02	PE	3699
$BC_3H_9O^+$	$(CH_3)_2BOCH_3$	4443-43-0	**	10.32 (V)	PE	4065
$BC_3H_9O_2^+$	$(CH_3O)_2BCH_3$	7318-81-2	**	10.40 (V)	PE	4065
$BC_8H_{11}O_2^+$	$C_6H_5B(OCH_3)_2$ (Boric acid, phenyl-dimethyl ester)	13471-35-7	**	9.25 ± 0.05 (V)	PE	4956
$BC_3H_9O_3^+$	$B(OCH_3)_3$	121-43-7	**	10.40 (V)	PE	4065

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.			
NO ⁺									
^{(1)Σ⁺} ^{(3)Π, 1Π} ^{(3)Π} ^{(1)Σ⁺} ^{(1)Σ⁺} ^{(1)Σ⁺} ^{(2)Σ⁺} ^{(3)Π} ^{(3)Δ} ^{(2)Σ⁻} ^{(1)Σ⁻} ^{(1)Π} ^{(3)Π} ^{(1)Π} ^{(1)Σ⁺} ^{(1)Σ⁺}	NO	10102-43-9	**	9.26436±0.00006	S	5144			
			**	21.72	S	4176			
			**	21.721±0.006	S	3761			
			**	9.26 (V)	PE	4843			
			**	9.262±0.003	PE	3516			
			**	9.27	PE	4073			
			**	15.667±0.003	PE	3516			
			**	16.562±0.003	PE	3516			
			**	16.863±0.003	PE	3516			
			**	17.586±0.003	PE	3516			
			**	17.811±0.003	PE	3516			
			**	18.319±0.003	PE	3516			
			**	21.722±0.010	PE	3516			
			**	21.722±0.010	PE	3516			
			**	22.727±0.10	PE	3516			
			**	9.27±0.05	EI	3453			
	N ₂ O	10024-97-2	N	15.01	PI	4356			
			N(² D°)	16.53±0.01	PI	4356			
			N(² P°)	17.73±0.01	PI	4356			
			N	16±1	PI	5170			
				11.75±0.01	PI	3524			
			CH ₃ O	10.917±0.008	PI	3524			
				10.20	EI	4809			
				10.50	EI	4809			
				12.20	EI	4809			
				9.90	EI	4809			
CH ₃ NO ₂ CH ₃ ONO ((CH ₃) ₂ C(CN)NO) ₂ ((CH ₃) ₂ C(NO)COCH ₃) ₂ (C ₆ H ₁₁ NO ₂) ₂ ((CH ₃) ₂ C(NO)COOCH ₃) ₂ ((CH ₃) ₂ C(NO)OOCCH ₃) ₂ ((CH ₃) ₂ C(NO ₂)NO) ₂ CF ₃ NO ClNO (CH ₃) ₂ CClNO (CH ₃) ₂ CBrNO	75-52-5 624-91-9 31018-29-8 30442-79-6 68777-99-1 6144-15-6 68777-98-0 5275-46-7 XXXXXX-XX-X XXXXXX-XX-X 2421-26-3 7119-91-7	CF ₃ Cl CH ₃ CCl		12.4±0.1	EI	5220			
				11.0±0.02	EI	5220			
				12.75	EI	4809			
				11.10	EI	4809			
			NO ⁺²						
			^{(2)Σ⁺, 2Π} ^{(2)Σ⁺} ^{(2)Σ⁺, 2Π}	NO	10102-43-9	**	39.3±0.5	OTH	5007
						**	42.4±1.0	OTH	5007
						**	47.2±0.5	OTH	5007
			N ₂ O ⁺						
			^{(2)Π_{3/2}} ^{(2)Π_{1/2}} ^{(2)Σ⁺} ^{(2)Π} ^{(2)Π} ^{(2)Σ⁺} ^{(2)Σ⁺} ^{(2)Σ⁺}	N ₂ O	10024-97-2	**	12.88±0.005	PI	4356
**	12.89±0.005	PI				4356			
**	16.37±0.01	PI				4356			
**	12±1	PI				5170			
**	12.886±0.002	PE				4752			
**	12.89 (V)	PE				5055			
**	12.90	PE				3998			
**	16.388±0.001	PE				4752			
**	16.40	PE				3998			
**	20.105±0.002	PE				4752			
**	12.91±0.03	EI				4877			
**	13.15	EI				4809			
(CH ₃) ₂ CBrNO	7119-91-7								
N ₂ O ²⁺									
	N ₂ O	10024-97-2				**	37.3±0.5	OTH	5147
NO ₂ ⁺									
	NO ₂	10102-44-0	**	<9.62±0.01	PI	3927			
			**	10.4±0.3	EI	5176			
			**	35.0±0.5	EI	5176			

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
N_2O_1^+	N_2O_1	10544-72-6	**	10.8 ± 0.2	PE	4700
			**	11.4 ± 0.1 (V)	PE	4709
			**	11.4 ± 0.1 (V)	PE	5262
			**	11.45 ± 0.1 (V)	PE	5383
			**	11.6 (V)	PE	4561
			**	11-12 (V)	PE	4631
N_2O_3^+	N_2O_3	10102-03-1	**	12.3 (V)	PE	4561
HNO^+	HNO	14332-28-6	**	8.6 (V)	PE	4467
	$((\text{CH}_3)_2\text{C}(\text{NO})\text{OOCCH}_3)_2$	68777-98-0		14.20	EI	4809
	$(\text{CH}_3)_2\text{CBrNO}$	7119-91-7		12.75	EI	4809
H_3NO^+	NH_2OH	7803-49-8	**	10.59 (V)	PE	4768
				10.64 (V)	PE	5288
$\text{C}_6\text{H}_7\text{NO}^+$	$\text{C}_5\text{H}_4\text{N}(\text{O})\text{CH}_3$ (Pyridine, 2-methyl-, 1-oxide)	931-19-1	**	8.21 ± 0.02 (V)	PE	4275
HNO_2^+	HNO_2	7782-77-6	**	11.3 (V)	PE	4467
HNO_3^+	HNO_3	7697-37-2	**	11.95 ± 0.01	PE	4477
			**	11.96	PE	4404
			**	12.2 (V)	PE	4561
$\text{C}_2\text{N}_2\text{O}^+$	NCNCO	22430-66-6	**	11.49 ± 0.02	PE	4746
$\text{C}_3\text{N}_2\text{O}^+$	$(\text{CN})_2\text{CO}$	1115-12-4	**	12.56 (V)	PE	3726
CNO_2^+	$((\text{CH}_3)_2\text{C}(\text{NO}_2)\text{NO})_2$	5275-46-7		10.15	EI	4809
$\text{C}_6\text{H}_5\text{NO}_3^+$	$\text{C}_6\text{H}_4(\text{OH})\text{NO}_2$ (Phenol, 4-nitro-)	100-02-7	**	7.38	EI	4089
CHNO^+	HNCO	75-13-8	**	11.62 ± 0.02	PE	3670
	HCNO	506-85-4	**	10.83	PE	4595
CH_2NO^+	HCONH_2	75-12-7		12.00	EI	4878
	CH_3CONH_2	60-35-5		11.60	EI	4878
	$(\text{NH}_2)_2\text{CO}$	57-13-6		12.90	EI	4878
	$\text{NHCH}_2\text{CONH}_2$	598-50-5		13.25	EI	4878
	$\text{N}(\text{CH}_3)_2\text{CONH}_2$	1320-50-9		13.70	EI	4878
CH_3NO^+	HCONH_2	75-12-7	**	10.16 ± 0.03	PI	3765
			**	10.50 ± 0.05	EI	4759
	$\text{CH}_2=\text{NOH}$	75-17-2	**	10.62 (V)	PE	4650
	CH_3NO	865-40-7	**	8.68 ± 0.1 (V)	PE	4465
				9.76 ± 0.05 (V)	PE	5298

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
CH_3NO^+	CH_3NO	865-40-7	** **	9.8 9.8 (V)	PE PE	4379 4467
CH_3NO^+	H_2NOCH_3	67-62-9	**	10.25 (V)	PE	5288
	CH_3NHOH	593-77-1		10.28 (V) 9.82 (V)	PE PE	4768 5288
$\text{C}_2\text{H}_3\text{NO}^+$	CH_3NCO	624-83-9	**	10.67 ± 0.02	PE	3670
$\text{C}_2\text{H}_4\text{NO}^+$	HCONHCH_3	123-39-7		11.20	EI	4878
	$\text{CH}_3\text{CONHCH}_3$	79-16-3		11.80	EI	4878
	$(\text{NHCH}_3)_2\text{CO}$	96-31-1		11.90	EI	4878
	$\text{N}(\text{CH}_3)_2\text{CONHCH}_3$	632-14-4		12.40	EI	4878
	$((\text{CH}_3)_2\text{C}(\text{NO})\text{OOCCH}_3)_2$	68777-98-0		10.30	EI	4809
	$((\text{CH}_3)_2\text{C}(\text{NO}_2)\text{NO})_2$	5275-46-7		10.15	EI	4809
	$(\text{CH}_3)_2\text{CBrNO}$	7119-91-7		10.10	EI	4809
$\text{C}_2\text{H}_5\text{NO}^+$	CH_3CONH_2	60-35-5	** ** ** ** ** ** ** **	9.65 ± 0.03 9.62 9.62 9.80 10.15 ± 0.05 10.20 (V) 10.00 ± 0.05 10.1 ± 0.2	PI PE PE PE EI PE EI EI	3765 4471 4520 3718 4759 4650 4759 4099
$\text{C}_2\text{H}_7\text{NO}^+$	$\text{NH}_2\text{CH}_2\text{CH}_2\text{OH}$	141-43-5	**	9.87 ± 0.06 (V)	PE	3987
	$\text{CH}_3\text{NHOCH}_3$	1117-97-1		9.48 (V)	PE	5288
	$(\text{CH}_3)_2\text{NOH}$	5725-96-2		9.18 (V)	PE	5288
$\text{C}_3\text{H}_2\text{NO}^+$	$\text{C}_3\text{H}_3\text{NO}$ (Oxazole)	288-42-6	H	12.7	EI	5400
$\text{C}_3\text{H}_3\text{NO}^+$	$\text{CH}_2=\text{CHNCO}$	3555-94-0	**	9.80 ± 0.1 (V)	PE	5541
	$\text{C}_3\text{H}_3\text{NO}$ (Isoxazole)	288-14-2	**	10.20 (V)	PE	5213
	$\text{C}_3\text{H}_3\text{NO}$ (Oxazole)	288-42-6	**	9.6	EI	5400
$\text{C}_3\text{H}_5\text{NO}^+$	$\text{C}_3\text{H}_5\text{NCO}$	109-90-0	**	10.32 ± 0.05 (V)	PE	5026
	$(\text{CH}_3)_2\text{CBrNO}$	7119-91-7		10.60	EI	4809
$\text{C}_3\text{H}_6\text{NO}^+$	$\text{HCON}(\text{CH}_3)_2$	68-12-2		11.35	EI	4878
	$\text{CH}_3\text{CON}(\text{CH}_3)_2$	127-19-5		11.60	EI	4878
	$\text{N}(\text{CH}_3)_3\text{CONHCH}_3$	632-14-4		12.40	EI	4878
	$((\text{CH}_3)_2\text{N})_2\text{CO}$	632-22-4		11.75	EI	4878
	$((\text{CH}_3)_2\text{C}(\text{NO})\text{OOCCH}_3)_2$	68777-98-0		10.25	EI	4809
	$(\text{CH}_3)_2\text{CCINO}$	2421-26-3		11.80	EI	4809
	$(\text{CH}_3)_2\text{CBrNO}$	7119-91-7		10.35	EI	4809
$\text{C}_3\text{H}_7\text{NO}^+$	$\text{HCON}(\text{CH}_3)_2$	68-12-2	**	9.45 ± 0.05	EI	4759

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₃H₇NO⁺	CH ₃ CONHCH ₃	79-16-3	**	9.85 (V)	PE	3718
			**	9.70±0.05	EI	4759
	(CH ₃) ₂ C=NOH	127-06-0	**	9.67 (V)	PE	4650
	C ₃ H ₆ ONH (Isoxazolidine)	504-72-3	**	9.57 (V)	PE	5301
	((CH ₃) ₂ C(NO)OOCCH ₃) ₂	68777-98-0		10.70	EI	4809
C₃H₉NO⁺	CH ₃ OCH ₂ CH ₂ NH ₂	109-85-3	**	9.45±0.09 (V)	PE	3987
	NH ₂ (CH ₂) ₃ OH	156-87-6	**	9.77±0.20 (V)	PE	3987
	(CH ₃) ₄ NO	1184-78-7	**	8.27 (V)	PE	4537
			**	8.375±0.035 (V)	PE	5529
	(CH ₃) ₂ NOCH ₃	5669-39-6		8.81 (V)	PE	5288
C₄H₇NO⁺	C ₄ H ₇ N(=O) (2-Pyrrolidinone)	616-45-5	**	9.53 (V)	PE	4742
C₄H₈NO⁺	(C ₆ H ₁₁ NO ₂) ₂	68777-99-1		9.40	EI	4809
C₄H₉NO⁺	C ₄ H ₉ ON(CH ₃) (Isoxazolidine, 2-methyl-)	22445-44-9	**	8.60 (V)	PE	5301
	CH ₃ CON(CH ₃) ₂	127-19-5	**	9.43 (V)	PE	3718
			**	9.20±0.05	EI	4759
	<i>n</i> -C ₃ H ₇ CH=NOH	110-69-0	**	9.93 (V)	PE	4650
	<i>tert</i> -C ₄ H ₉ NO	917-95-3	**	7.99±0.1 (V)	PE	4465
			**	8.95 (V)	PE	4719
			**	9.05±0.05 (V)	PE	5298
	C ₄ H ₉ NO (Morpholine)	110-91-8	**	8.88±0.05	PE	4654
			**	8.88±0.05 (V)	PE	4819
			**	8.91±0.03 (V)	PE	4452
	C ₄ H ₈ ONH (2H-1,2-Oxazine, tetrahydro-)	36652-42-3	**	9.00 (V)	PE	5301
C₄H₁₁NO⁺	(CH ₃) ₂ NC ₂ H ₄ OH	108-01-0	**	8.82 (V)	PE	4537
			**	8.85±0.04 (V)	PE	3987
	CH ₃ O(CH ₂) ₃ NH ₂	5332-73-0	**	9.37±0.12 (V)	PE	3987
C₅H₃NO⁺	C ₄ H ₃ OCN (2-Furancarbonitrile)	617-90-3	**	9.47±0.05 (V)	PE	4626
			**	9.77±0.05	EI	3482
C₅H₅NO⁺	C ₅ H ₄ N(OH) (2-Pyridinol)	109-10-4	**	9.11±0.03 (V)	PE	4711
			**	9.28±0.02	EI	3636
	C ₅ H ₄ N(OH) (3-Pyridinol)	109-00-2	**	9.15±0.03 (V)	PE	4711
			**	9.5±0.1	EI	4302
			**	9.55±0.02	EI	3636
			**	9.55±0.05	EI	3635
	C ₅ H ₄ N(OH) (4-Pyridinol)	626-64-2	**	9.8±0.03	PE	4711
			**	9.6±0.1	EI	4302
			**	9.89±0.02	EI	3636
	C ₅ H ₅ NO (Pyridine, 1-oxide)	694-59-7	**	8.38±0.02	PE	4470

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₅H₅NO⁺	C ₅ H ₅ NO	694-59-7	** **	8.38±0.02 (V) 8.46 (V)	PE PE	4275 4222
	C ₅ H ₄ NOH (2-Pyridinol)	72762-00-6	**	8.62 (V)	PE	5191
	C ₅ H ₄ NH(=O) (2(1H)-Pyridinone)	142-08-5	**	8.62±0.03 (V)	PE	4711
	C ₅ H ₄ NH(=O) (2(1H)-Pyridinone)	142-08-5	**	9.0±0.1	EI	4302
	C ₅ H ₄ NCHO (1-H-Pyrrole-2-carboxaldehyde)	1003-29-8	**	8.93±0.05	EI	3482
	C₅H₈NO⁺ (CH ₃) ₂ NCOCH=CHCH ₃	23135-18-4	CH ₃	11.0±0.1	EI	3996
	C₅H₉NO⁺ <i>n</i> -C ₅ H ₉ NCO <i>tert</i> -C ₅ H ₉ CNO <i>tert</i> -C ₅ H ₉ C≡NO C ₅ H ₅ CHN(CH ₃)O (Methanaminium,N-(cyclopropylmethylene)-N-hydroxy-hydroxide,inner salt) C ₅ H ₆ N(=O)CH ₃ (3-Pyrrolidinone, 1-methyl-)	111-36-4 1609-86-5 27143-81-3 65194-05-0 68165-06-0	** ** ** ** **	10.14±0.05 (V) 9.57 (V) 9.55±0.05 (V) 8.30 8.83 (V)	PE PE PE PE PE	5026 4674 4719 5099 4742
C₅H₁₁NO⁺	C ₅ H ₈ ON(CH ₃) (2H-1,2-Oxazine,tetrahydro-2-methyl-)	22445-43-8	**	8.66 (V)	PE	5301
	<i>n</i> -C ₅ H ₇ CHNO(CH ₃) (Oxaziridine, 2-methyl-3-propyl-)	58751-77-2	**	9.40±0.05	EI	4677
	CH ₃ COCH ₂ N(CH ₃) ₂	15364-56-4	**	7.71±0.05	PE	4192
	<i>n</i> -C ₅ H ₇ CONHCH ₃	17794-44-4	**	9.68±0.05	EI	4677
	<i>n</i> -C ₅ H ₇ CH=NOCH ₃	31376-98-4	**	9.33±0.05	EI	4677
	<i>n</i> -C ₅ H ₇ CH=N(O)CH ₃	44603-43-2	**	8.57±0.05	EI	4677
	<i>tert</i> -C ₅ H ₉ N(=CH ₂)O	41012-82-2	**	8.64	PE	5099
			**	8.64 (V)	PE	4719
	<i>cis</i> -C ₅ H ₈ (OH)NH ₂ (Cyclopentanol, <i>cis</i> -2-amino-)	57070-95-8	**	8.61	PE	4399
	<i>trans</i> -C ₅ H ₈ (OH)NH ₂ (Cyclopentanol, <i>trans</i> -2-amino-)	59260-76-3	**	8.30	PE	4399
C₅H₁₃NO⁺	(CH ₃) ₂ N(CH ₂) ₄ OH	3179-63-3	**	8.74±0.04 (V)	PE	3987
	C₆H₅NO⁺ C ₆ H ₅ NO (Benzene, nitroso-)	586-96-9	** ** ** **	8.09 8.9 (V) 8.90±0.1 (V) 9.84±0.1 (V)	PE PE PE PE	3938 4467 4465 4401
C₆H₆NO⁺	C ₆ H ₄ (NH ₂)OCH ₃ (Benzenamine, 3-methoxy-)	536-90-3	CH ₃	11.07±0.1	EI	3446
	C ₆ H ₄ (NH ₂)OCH ₃ (Benzenamine, 4-methoxy-)	104-94-9	CH ₃	10.43±0.1	EI	3446
	C ₆ H ₅ COC ₂ H ₄ NCH ₃ (Methanone,(1-methyl-1H-pyrrol-2-yl)phenyl-)	37496-06-3	C ₆ H ₅	12.2±0.1	EI	5493
	C ₆ H ₄ (OH)NHCOCH ₃ (Acetamide, <i>N</i> -(2-hydroxyphenyl)-)	614-80-2	CH ₃ CO	13.46±0.02	EI	3631
	C ₆ H ₄ (OH)NHCOCH ₃ (Acetamide, <i>N</i> -(4-hydroxyphenyl)-)	103-90-2	CH ₃ CO	13.52±0.02	EI	3631
	C ₆ H ₄ (NO ₂)NH ₂ (Benzenamine, 3-nitro-)	99-09-2	NO	9.12±0.1	EI	3447

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₆H₆NO⁺	C ₆ H ₄ (NO ₂)NH ₂ (Benzenamine, 4-nitro-)	100-01-6	NO	9.56±0.1	EI	3447
C₆H₇NO⁺	C ₅ H ₄ N(OCH ₃) (Pyridine, 2-methoxy-)	1628-89-3	**	8.82±0.03 (V)	PE	4711
			**	8.9±0.1	EI	4302
			**	8.96±0.02	EI	3636
	C ₅ H ₄ N(OCH ₃) (Pyridine, 3-methoxy-)	7295-76-3	**	9.34±0.02	EI	3636
			**	9.34±0.05	EI	3635
	C ₅ H ₄ N(OCH ₃) (Pyridine, 4-methoxy-)	620-08-6	**	9.58±0.02	EI	3636
	C ₅ H ₄ N(=O)CH ₃ (2(1H)-Pyridinone, 1-methyl-)	694-85-9	**	8.58±0.02	EI	3636
			**	8.41±0.03 (V)	PE	4711
	C ₅ H ₄ N(=O)CH ₃ (4(1H)-Pyridinone, 1-methyl-)	695-19-2	**	8.48±0.02	EI	3636
			**	8.20±0.03 (V)	PE	4711
	C ₅ H ₃ N(CH ₃)OH (2-Pyridinol, 6-methyl-)	73229-70-6	**	8.33 (V)	PE	5191
			**	8.69±0.03	OTH	5596
	C ₄ H ₄ NCOCH ₃ (Ethanone, 1-(1H-pyrrol-2-yl)-)	1072-83-9	**	8.72±0.05	EI	3482
	C ₅ H ₄ N(O)CH ₃ (Pyridine, 3-methyl-, 1-oxide)	1003-73-2	**	8.20±0.02 (V)	PE	4275
	C ₅ H ₄ N(O)CH ₃ (Pyridine, 4-methyl-, 1-oxide)	1003-67-4	**	8.12±0.02 (V)	PE	4275
			**	8.17 (V)	PE	4222
	C ₅ H ₄ N(O)CH ₃ (Pyridinium, 3-hydroxy-1-methyl-, hydroxide, inner salt)	25065-00-3	**	7.90±0.02	EI	3636
			**	7.90±0.05	EI	3635
	C ₅ H ₃ N(OH)CH ₃ (3-Pyridinol, 6-methyl-)	1121-78-4	**	9.15±0.05	EI	3635
	C ₅ H ₃ NH(CH ₃)(=O) (2(1H)-Pyridinone, 6-methyl-)	3279-76-3	**	8.19±0.03	OTH	5596
	C ₆ H ₄ (OH)NHC(=O)CH ₃ (Acetamide, N-(2-hydroxyphenyl)-)	614-80-2	CH ₂ =C=O	9.41±0.02	EI	3631
	C ₆ H ₄ (OH)NHC(=O)CH ₃ (Acetamide, N-(4-hydroxyphenyl)-)	103-90-2	CH ₂ =C=O	9.82±0.02	EI	3631
C₆H₁₁NO⁺	(CH ₃) ₂ NCOCH=CHCH ₃	23135-18-4	**	9.0±0.1	EI	3996
C₆H₁₂NO⁺	C ₁₁ H ₂₀ N ₂ O ₄ (L-Alanine, N-(N-acetyl-L-valyl)-methyl ester)	55728-13-7		9.2±0.1	PI	5279
C₆H₁₃NO⁺	cis-C ₆ H ₁₀ (OH)NH ₂ (Cyclohexanol, 2-amino-, cis-)	931-15-7	**	9.59 (V)	PE	4450
	trans-C ₆ H ₁₀ (OH)NH ₂ (Cyclohexanol, 2-amino-, trans-)	6982-39-4	**	9.49 (V)	PE	4450
	C ₁₁ H ₂₀ N ₂ O ₄ (L-Alanine, N-(N-acetyl-L-valyl)-methyl ester)	55728-13-7		8.8±0.1	PI	5279
C₆H₁₅NO⁺	(C ₂ H ₅) ₂ NCH ₂ CH ₂ OH	100-37-8	**	8.58±0.03 (V)	PE	3987
C₇H₄NO⁺	C ₆ H ₃ (CN)OCH ₃ (Benzonitrile, 3-methoxy-)	1527-89-5	CH ₃	12.75±0.1	EI	3446

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₇H₁NO⁺	C ₆ H ₄ (CN)OCH ₃ (Benzonitrile, 4-methoxy-)	874-90-8	CH ₃	12.65±0.1	EI	3446
	C ₆ H ₄ (NO ₂)CN (Benzonitrile, 3-nitro-)	619-24-9	NO	10.45±0.1	EI	3447
	C ₆ H ₄ (NO ₂)CN (Benzonitrile, 4-nitro-)	619-72-7	NO	10.80±0.1	EI	3447
C₇H₅NO⁺	C ₆ H ₅ N=C=O (Benzene, isocyanato-)	103-71-9	**	9.00 (V)	PE	4495
			**	9.2	EI	4660
	C ₆ H ₅ CNO (Benzonitrile, N-oxide)	873-67-6	**	8.96±0.02 (V)	PE	4674
C₇H₆NO⁺	C ₆ H ₅ COC ₆ H ₄ NH ₂ (Methanone, (2-aminophenyl)phenyl-)	2835-77-0		11.9±0.1	EI	4358
				11.9±0.1	EI	4335
	C ₆ H ₅ COC ₆ H ₄ NH ₂ (Methanone, (3-aminophenyl)phenyl-)	2835-78-1		12.0±0.1	EI	4335
				12.0±0.1	EI	4358
	C ₆ H ₅ COC ₆ H ₄ NH ₂ (Methanone, (4-aminophenyl)phenyl-)	1137-41-3		11.25±0.1	EI	4335
				11.25±0.1	EI	4358
	CH ₃ C ₆ H ₄ NO ₂ (Benzene, 1-methyl-2-nitro-)	88-72-2	OH	9.69±0.05	PI	5437
	C ₆ H ₄ (NH ₂)COOH (Benzoic acid, 3-amino-)	99-05-8	OH	12.18±0.2	EI	3973
	C ₆ H ₄ (NH ₂)COOH (Benzoic acid, 4-amino-)	150-13-0	OH	12.12±0.2	EI	3973
	C ₆ H ₄ (Cl)NHCHO (Formamide, N-(2-chlorophenyl)-)	2596-93-2	Cl	9.3±0.1	EI	4359
C₇H₇NO⁺	C ₆ H ₄ (NO)(CH ₃) (Benzene, 1-methyl-4-nitroso-)	623-11-0	**	8.79±0.1 (V)	PE	4465
	C ₆ H ₅ CONH ₂ (Benzamide)	55-21-0	**	9.45 (V)	PE	4918
			**	9.60	EI	3792
C₇H₉NO⁺	C ₅ H ₇ N(OC ₂ H ₅) (Pyridine, 4-ethoxy-)	33399-46-1	**	9.25±0.03 (V)	PE	4711
	C ₆ H ₄ (NH ₂)OCH ₃ (Benzenamine, 3-methoxy-)	536-90-3	**	7.76±0.1	EI	3446
	C ₆ H ₄ (NH ₂)OCH ₃ (Benzenamine, 4-methoxy-)	104-94-9	**	7.44	PI	4328
			**	7.08	PE	4621
			**	7.58±0.01 (V)	PE	4389
			**	7.58 (V)	PE	5403
			**	6.92	EI	3845
			**	7.60±0.1	EI	3446
			**	9.39	EI	4089
C₇H₁₀NO⁺	C ₄ H ₈ NCOCH=CHCH ₃ (Pyrrolidine, 1-(1-oxo-2-butenyl)-)	51944-65-1	CH ₃	11.2±0.1	EI	3996
C₇H₁₁NO⁺	C ₅ H ₉ NCOCH ₃ (Pyridine, 1-acetyl-1,2,3,4-tetrahydro-)	19615-27-1	**	8.8	EI	4046

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_7H_{13}NO^+$	$C_7H_{12}NOH$ (1-Azabicyclo[2.2.2]octan-4-ol)	26458-74-2	**	8.48 ± 0.015 (V)	PE	4286
	$C_6H_{10}N(=O)CH_3$ (2H-Azepin-2-one, hexahydro-1-methyl-)	2556-73-2	**	9.00 ± 0.05	EI	4677
	$C_6H_{10}(=NOCH_3)$ (Cyclohexanone, O-methyloxime)	13858-85-0	**	9.01 ± 0.05	EI	4677
	$C_6H_{10}(=N(O)CH_3)$ (Methanamine, N-cyclohexylidene-N-oxide)	58751-78-3	**	7.97 ± 0.05	EI	4677
	$C_6H_{10}NOCH_3$ (1-Oxa-2-azaspiro[2.5]octane, 2-methyl-)	3400-13-3	**	8.93 ± 0.05	EI	4677
	$C_5H_{10}NCOCH_3$ (Piperidine, 1-acetyl-)	618-42-8	**	9.1	EI	4046
$C_7H_{15}NO^+$	$C_7H_6ON(C(CH_3)_3)$ (Isoxazolidine, 2-(1,1-dimethylethyl)-)	67137-81-9	**	8.25	PE	5301
	$cis-C_5H_8(OH)N(CH_3)_2$ (Cyclopentanol, <i>cis</i> -2-(dimethylamino)-)	57070-96-9	**	7.80	PE	4399
	$trans-C_5H_8(OH)N(CH_3)_2$ (Cyclopentanol, <i>trans</i> -2-(dimethylamino)-)	18760-79-7	**	7.45	PE	4399
$C_7H_{17}NO^+$	$(C_2H_5)_2N(CH_2)_3OH$	622-93-5	**	8.56 ± 0.05 (V)	PE	3987
$C_8H_4NO^+$	$C_6H_4(CN)COOH$ (Benzoic acid, 4-cyano-)	619-65-8	OH	12.68 ± 0.2	EI	3973
$C_8H_7NO^+$	$C_6H_4(NCO)CH_3$ (Benzene, 1-isocyanato-2-methyl-)	614-68-6	**	8.7 ± 0.1 (V)	PE	5026
	$C_6H_4(NCO)CH_3$ (Benzene, 1-isocyanato-3-methyl-)	621-29-4	**	8.7 ± 0.1 (V)	PE	5026
			**	8.83 (V)	PE	4495
	$C_6H_4(NCO)CH_3$ (Benzene, 1-isocyanato-4-methyl-)	622-58-2	**	8.6 ± 0.1 (V)	PE	5026
	$C_6H_4(CN)OCH_3$ (Benzonitrile, 3-methoxy-)	1527-89-5	**	9.11 ± 0.1	EI	3446
	$C_6H_4(CN)OCH_3$ (Benzonitrile, 4-methoxy-)	874-90-8	**	8.74	EI	3845
			**	8.97 ± 0.1	EI	3446
	$C_6H_4C_2H_2NH(=O)$ (2H-Indol-2-one, 1,3-dihydro-)	59-48-3	**	8.36 (V)	PE	5406
$C_8H_8NO^+$	$C_6H_5NHCOCH_3$ (Acetamide, N-phenyl-)	103-84-4	H	11.00	EI	4834
	$C_6H_4ClNHCOCH_3$ (Acetamide, N-(2-chlorophenyl)-)	533-17-5	Cl	9.40	EI	4834
			Cl	9.40	EI	4834
				8.86 ± 0.03	EI	3483
	$C_6H_4(Cl)(CH_3)NHCHO$ (Formamide, <i>N</i> -(2-chloro-4-methylphenyl)-)	18931-77-6	Cl	9.1 ± 0.1	EI	4359
	$C_6H_4(Cl)(CH_3)NHCHO$ (Formamide, <i>N</i> -(2-chloro-5-methylphenyl)-)	18931-82-3	Cl	9.1 ± 0.1	EI	4359
	$C_6H_4BrNHCOCH_3$ (Acetamide, N-(2-bromophenyl)-)	614-76-6	Br	9.40	EI	4834
				9.08 ± 0.03	EI	3483
	$C_6H_4INHCOCH_3$ (Acetamide, N-(2-iodophenyl)-)	19591-17-4	I	9.30	EI	4834
				8.57 ± 0.03	EI	3483

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₈H₉NO⁺	C ₆ H ₄ (CH ₃)(CONH ₂) (Benzamide, 3-methyl-)	618-47-3	**	9.11 (V)	PE	4918
	C ₆ H ₄ (CH ₃)(CONH ₂) (Benzamide, 4-methyl-)	619-55-6	**	9.14 (V)	PE	4918
	C ₆ H ₄ NH ₂ (COCH ₃) (Ethanone, 1-(4-aminophenyl)-)	99-92-3	**	7.8±0.1	PE	4401
	C ₆ H ₅ CHNO(CH ₃) (Oxaziridine, 2-methyl-3-phenyl-)	3400-12-2	**	8.36±0.05	EI	4677
	C ₆ H ₅ CH=N(O)CH ₃	XXXXXX-XX-X	**	8.01 (V)	PE	5590
	C ₆ H ₅ NHC(=O)CH ₃ (Acetamide, N-phenyl)	103-84-4	**	8.30±0.10	PE	5608
			**	8.46±0.05 (V)	PE	5013
			**	8.46 (V)	PE	5406
			**	8.60	EI	4834
			**	8.18±0.03	EI	3483
	C ₆ H ₅ CH=NOCH ₃ (Benzaldehyde, O-methyloxime)	3376-32-7	**	8.76±0.05	EI	4677
	C ₆ H ₅ CONHCH ₃ (Benzamide, N-methyl-)	613-93-4	**	9.33±0.05	EI	4677
	C ₆ H ₅ CH=N(CH ₃)O (Methanamine, N-(phenylmethylene)-N-oxide)	3376-23-6	**	7.89 (V)	PE	4719
			**	8.01±0.02 (V)	PE	4674
			**	8.01	PE	5099
			**	8.08±0.05	EI	4677
	C ₇ H ₆ N(CH ₃)O (Methanaminium, N-2,4,6-cycloheptatrien-1-ylidene-N-hydroxy-hydroxide, inner salt)	65194-06-1	**	7.28	PE	5099
	C ₆ H ₄ (OH)CHN(O)CH ₃ (Phenol, 4-amino-N-oxide)	16089-67-1	**	7.76±0.02 (V)	PE	4674
C₈H₁₁NO⁺	C ₆ H ₄ (OH)(CH ₂ NHCH ₃) (Benzenemethanamine, 2-hydroxy-N-methyl-)	XXXXXX-XX-X	**	8.18 (V)	PE	5134
	C ₆ H ₄ (OH)CH ₂ CH ₂ NH ₂ (Phenol, 4-(2-aminoethyl)-)	51-67-2	**	8.41±0.12 (V)	PE	4672
C₈H₁₂NO⁺	C ₅ H ₁₀ NCOCH=CHCH ₃ (Piperidine, 1-(1-oxo-2-butenyl)-)	3626-69-5	**	11.1±0.1	EI	3996
C₈H₁₃NO⁺	C ₄ H ₈ NCOCH=CHCH ₃ (Pyrrolidine, 1-(1-oxo-2-butenyl)-)	51944-65-1	**	9.0±0.1	EI	3996
C₈H₁₅NO⁺	C ₇ H ₁₂ NCH ₂ OH (1-Azabicyclo[2.2.2]octane-4-methanol)	26608-58-2	**	8.17±0.015 (V)	PE	4286
	C ₈ H ₁₅ NO (8-Azabicyclo[3.2.1]octan-3-ol, 8-methyl- <i>endo</i> -)	120-29-6	**	8.1±0.15	EI	5401
	C ₈ H ₁₅ NO (8-Azabicyclo[3.2.1]octan-3-ol, 8-methyl- <i>exo</i> -)	135-97-7	**	7.9±0.15	EI	5401
	((CH ₂) ₄ ON)CH=C(CH ₃) ₂ (Morpholine, 4-(2-methyl-1-propenyl)-)	2403-55-6	**	8.20±0.03 (V)	PE	4452
C₈H₁₇NO⁺	C ₁ H ₆ ON(C(CH ₃) ₃) (2H-1,2-Oxazine, 2-(1,1-dimethylethyl)tetrahydro-)	54722-72-4	**	8.27 (V)	PE	5301
	CH ₃ CH(CH ₃)CON(C ₂ H ₅) ₂	33931-44-1	**	8.80 (V)	PE	4672
	<i>cis</i> -C ₆ H ₁₀ (OH)N(CH ₃) ₂ (Cyclohexanol, 2-(dimethylamino)-, <i>cis</i> -)	20431-82-7	**	8.64 (V)	PE	4450
	<i>trans</i> -C ₆ H ₁₀ (OH)N(CH ₃) ₂ (Cyclohexanol, 2-(dimethylamino)-, <i>trans</i> -)	15910-74-4	**	8.36 (V)	PE	4450

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_8H_{17}NO^+$	((CH ₂) ₄ ON)CH ₂ CH(CH ₃) ₂ (Morpholine, 4-(2-methylpropyl)-)	10315-98-7	**	8.46±0.03 (V)	PE	4452
$C_8H_{18}NO^+$	(tert-C ₄ H ₉) ₂ NO	2406-25-9	**	6.77	PE	3712
$C_9H_7NO^+$	C ₉ H ₇ NO (Isoquinoline, 2-oxide)	1532-72-5	**	7.98±0.02 (V)	PE	4551
	C ₉ H ₇ NO (Quinoline, 1-oxide)	1613-37-2	**	8.00±0.02 (V)	PE	4551
$C_9H_8NO^+$	C ₉ H ₅ NHCOCH=CHCH ₃ (2-Butenamide, <i>N</i> -phenyl-)	1733-40-0	CH ₃	12.1±0.3	EI	3996
$C_9H_9NO^+$	C ₉ H ₃ (CH ₃) ₂ CNO (Benzonitrile, 2,6-dimethyl- <i>N</i> -oxide)	19111-74-1	**	8.62±0.02 (V)	PE	4674
	C ₉ H ₉ NO (Isoquinoline, 3,4-dihydro-2-oxide)	24423-87-8	**	7.81 (V)	PE	4719
	C ₉ H ₄ C ₃ H ₅ NO (Isoquinolinium,3,4-dihydro-2-hydroxy-hydroxide,inner salt)	65194-03-8	**	7.81	PE	5099
$C_9H_{10}NO^+$	C ₉ H ₄ ClNHCOC ₂ H ₅ (Propanamide, <i>N</i> -(2-chlorophenyl)-)	2760-32-9	Cl	9.45	EI	4834
$C_9H_{11}NO^+$	C ₉ H ₅ N(CH ₃)C(=O)CH ₃ (Acetamide, <i>N</i> -methyl- <i>N</i> -phenyl-)	579-10-2	**	8.81 (V)	PE	5406
	C ₉ H ₄ (CH ₃)NHC(=O)CH ₃ (Acetamide, <i>N</i> -(2-methylphenyl)-)	120-66-1	**	8.34 (V)	PE	5406
	C ₉ H ₄ (CH ₃)NHC(=O)CH ₃ (Acetamide, <i>N</i> -(4-methylphenyl)-)	103-89-9	**	8.03±0.02	EI	3631
	C ₉ H ₃ (CHO)N(CH ₃) ₂ (Benzaldehyde, 4-(dimethylamino)-)	100-10-7	**	7.75±0.02	EI	3631
			**	7.36±0.02	PI	4028
			**	7.3±0.1	PE	4401
$C_9H_{13}NO^+$	C ₉ H ₄ (OCH ₃)(CH ₂ NHCH ₃) (Methanamine, <i>N</i> -[2-methoxyphenyl methylene]-)	1125-90-2	**	8.22 (V)	PE	5134
	C ₉ H ₄ N(O)(tert-C ₄ H ₉) (Pyridine, 4-(1,1-dimethylethyl)-, 1-oxide)	23569-17-7	**	8.00 (V)	PE	4222
	C ₉ H ₁₃ N=O (1-Azatricyclo[3.3.1.1 ^{3,7}]decan-4-one)	42949-24-6	**	8.21±0.02 (V)	PE	4217
	C ₉ H ₄ (OCH ₃)N(CH ₃) ₂ (Benzenamine, 4-methoxy- <i>N,N</i> -dimethyl-)	701-56-4	**	6.7±0.1	PE	4401
	C ₉ H ₄ (OCH ₃)N(CH ₃) ₂ (Benzenamine, 2-methoxy- <i>N,N</i> -dimethyl-)	700-75-4	**	7.18±0.01 (V)	PE	4389
	C ₉ H ₄ (O)N(CH ₃) ₃ (Benzenaminium, 2-hydroxy- <i>N,N,N</i> -trimethyl-, hydroxide, inner salt)	31061-58-2	**	~6.8	EI	3630
	C ₉ H ₄ (OCH ₃)CH ₂ CH ₂ NH ₂ (Benzenethanamine, 4-methoxy-)	55-81-2	**	8.16±0.08 (V)	PE	4672
	C ₉ H ₈ NCOCH=CHCH ₃ (Pyridine, 1,2,3,4-tetrahydro-1-(1-oxo-2-butenyl)-, (E))	50838-23-8	**	8.6	EI	4046
$C_9H_{15}NO^+$	C ₉ H ₉ NOC ₅ H ₇ (Morpholine, 4-(1-cyclopenten-1-yl)-)	936-52-7	**	7.60±0.05 (V)	PE	4654

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_9H_{15}NO^+$	$C_4H_8NOC_5H_7$	936-52-7	**	7.60 ± 0.05 (V)	PE	4819
	$C_5H_{10}NCOCH=CHCH_3$ (Piperidine, 1-(1-oxo-2-butenyl)-, (E))	50838-22-7		8.9	EI	4046
	$C_5H_{10}NCOCH=CHCH_3$ (Piperidine, 1-(1-oxo-2-butenyl)-)	3626-69-5	CH_3	8.9 ± 0.1	EI	3996
$C_9H_{17}NO^+$	$C_8H_{14}NOCH_3$ (9-Azabicyclo[3.3.1]nonane, 9-methoxy-)	73321-04-7	**	7.79 (V)	PE	5091
	$C_9H_{17}NO$ (8-Azabicyclo[3.2.1]octane, 3-methoxy-8-methyl- <i>endo</i> -)	XXXXXX-XX-X	**	7.8 ± 0.15	EI	5401
	$C_9H_{17}NO$ (8-Azabicyclo[3.2.1]octane, 3-methoxy-8-methyl- <i>exo</i> -)	16487-33-5	**	7.9 ± 0.15	EI	5401
	$C_9H_{17}NO$ (Bicyclo[2.2.1]heptan-2-ol, 3-(dimethylamino)-(2- <i>exo</i> , 3- <i>endo</i>)-)	57128-85-5	**	8.35 (V)	PE	5377
	$C_9H_{17}NO$ (Bicyclo[2.2.1]heptan-2-ol, 3-(dimethylamino)-(endo,endo)-)	57070-90-3	**	8.60 (V)	PE	5377
	$C_5H_5N(O)(CH_3)_4$ (4-Piperidinone, 2,2,6,6-tetramethyl-)	826-36-8	**	7.74	PE	4278
			**	8.30 ± 0.05	EI	3494
$C_9H_{18}NO^+$	$C_5H_6N(CH_3)_4O$ (1-Piperidinyloxy, 2,2,6,6-tetramethyl-)	2564-83-2	**	6.73	PE	3712
$C_{10}H_9NO^+$	$C_6H_6N_3(=O)(CH_3)$ (Indeno[1,2- <i>d</i>]triazol-8(3H)-one, 3a,8a-dihydro-3-methyl-)	55507-30-7	N_2	8.8 ± 0.2	EI	4863
$C_{10}H_{10}NO^+$	$C_6H_5CH_2NHCOCCH=CHCH_3$ (2-Butenamide, <i>N</i> -(phenylmethyl)-)	51944-67-3	CH_3	10.7 ± 0.1	EI	3996
$C_{10}H_{11}NO^+$	$C_6H_2(CH_3)_3(C \equiv NO)$ (Benzonitrile, 2,4,6-trimethyl- <i>N</i> -oxide)	2904-57-6	**	8.34 (V)	PE	4719
			**	8.35 ± 0.02 (V)	PE	4674
	$C_6H_5NHCOCCH=CHCH_3$ (2-Butenamide, <i>N</i> -phenyl-)	1733-40-0	**	8.7 ± 0.1	EI	3996
$C_{10}H_{12}NO^+$	$C_6H_4ClNHCOCCH_2CH_2CH_3$ (Butanamide, <i>N</i> -(2-chlorophenyl)-)	33694-15-4	Cl	9.45	EI	4834
$C_{10}H_{13}NO^+$	$C_6H_5(CH_3)_2NHCOCCH_3$ (Acetamide, <i>N</i> -(2,6-dimethylphenyl)-)	2198-53-0	**	8.70 ± 0.05 (V)	PE	5013
	$C_6H_4(CH_3)N(CH_3)C(=O)CH_3$ (Acetamide, <i>N</i> -methyl- <i>N</i> -(2-methylphenyl)-)	29823-47-0	**	8.82 (V)	PE	5406
	$C_6H_4(N(CH_3)_2)COCH_3$ (Ethanone, 1-[4-(dimethylamino)phenyl]-)	2124-31-4	**	7.57 ± 0.05 (V)	PE	5097
$C_{10}H_{15}NO^+$	$C_{10}H_{15}NO$ (Benzeneethanamine, 4-methoxy- α -methyl-(\pm)-)	23239-32-9	**	8.16 ± 0.06 (V)	PE	4758
$C_{10}H_{17}NO^+$	$C_4H_8NOC_6H_9$ (Morpholine, 4-(1-cyclohexen-1-yl)-)	670-80-4	**	7.67 ± 0.05	PE	4452
			**	7.67 ± 0.05	PE	4654
			**	7.67 ± 0.05 (V)	PE	4819

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{10}H_{19}NO^+$	$((CH_2)_4ON)(C_6H_{11})$ (Morpholine, 4-cyclohexyl-)	6425-41-8	**	8.18 ± 0.03 (V)	PE	4452
	$C_{10}H_{19}NO$ (Bicyclo[2.2.1]heptan-2-amine, 3-methoxy-N,N-dimethyl-(2-endo,3-exo)-)	67425-06-3	**	8.13 (V)	PE	5377
	$C_{10}H_{19}NO$ (Bicyclo[2.2.1]heptan-2-amine, 3-methoxy-N,N-dimethyl-(endo,endo)-)	67398-96-3	**	8.06 (V)	PE	5377
$C_{11}H_{13}NO^+$	$C_6H_5CH_2NHCOC(=O)CH=CHCH_3$ (2-Butenamide, N-(phenylmethyl)-)	51944-67-3	**	8.6 ± 0.1	EI	3996
$C_{11}H_{14}NO^+$	$C_{27}H_{30}N_4O_8S$ (L-Cysteine, S-(2-methoxy-2-oxoethyl)-N-[N-[N-(1-oxopropyl)-L-phenylalanyl]-L-leucyl]glycyl]-methyl ester)	35146-63-5		9.0 ± 0.1	PI	5279
	$C_6H_4ClNHCOC(CH_3)_3$ (Propanamide, N-(2-chlorophenyl)-2,2-dimethyl-)	62662-74-2	Cl	9.45	EI	4834
$C_{11}H_{15}NO^+$	$C_6H_5(CH_2)_2N(CH_3)C(=O)CH_3$ (Acetamide, N-(2,6-dimethylphenyl)-N-methyl-)	18835-47-7	**	8.8 (V)	PE	5406
	$C_6H_5(CH_2)_3CHN(CH_3)O$ (Methanamine, N-[(2,4,6-trimethylphenyl)methylene]-N-oxide)	41106-03-0	**	8.08	PE	5099
			**	8.08 (V)	PE	4719
	$C_6H_5CH=N(tert-C_4H_9)O$ (2-Propanamine, 2-methyl-N-(phenylmethylene)-N-oxide)	3376-24-7	**	7.69 (V)	PE	4719
$C_{11}H_{20}NO^+$	$C_{13}H_{25}NO$ (4-Quinolinol, 4-ethyldecahydro-1,2-dimethyl-(2 α ,4 α ,4 $\alpha\beta$,8 $\alpha\beta$))	20422-70-2	C_2H_5	9.92	EI	5452
	$C_{13}H_{25}NO$ (4-Quinolinol, 4-ethyldecahydro-1,2-dimethyl-(2 α ,4 α ,4 $\alpha\beta$,8 $\alpha\beta$))	20422-68-8	C_2H_5	9.81 ± 0.02	EI	5598
	$C_{13}H_{25}NO$ (4-Quinolinol, 4-ethyldecahydro-1,2-dimethyl-(2 α ,4 β ,4 $\alpha\beta$,8 $\alpha\beta$))	20422-72-4	C_2H_5	9.94	EI	5452
$C_{11}H_{22}NO^+$	$C_{30}H_{45}N_5O_6$ (L-Alanine, N-[N-[N-(1-oxodecyl)glycyl]-L-tryptophyl]-L-alanyl]-methyl ester)	19716-78-0		9.4 ± 0.1	PI	5279
$C_{12}H_8NO^+$	$C_{12}H_8NOH$ (Methanone, (2-nitrophenyl)-2-pyridinyl-)	27693-37-4		7.94	EI	5459
	$C_6H_5COC_5H_4N$ (Methanone, phenyl-2-pyridinyl-)	91-02-1		9.97	EI	5459
	$C_6H_5(CH_3)COC_5H_4N$ (Methanone, (2-methylphenyl)-2-pyridinyl-)	54523-78-3		9.71	EI	5459
	$C_6H_4FCOC_5H_4N$ (Methanone, (2-fluorophenyl)-2-pyridinyl-)	XXXXXX-XX-X		10.15	EI	5459
	$C_6H_4ClCOC_5H_4N$ (Methanone, (2-chlorophenyl)-2-pyridinyl-)	1694-57-1		9.59	EI	5459
	$C_6H_4BrCOC_5H_4N$ (Methanone, (2-bromophenyl)-2-pyridinyl-)	XXXXXX-XX-X		9.37	EI	5459
	$C_6H_4ICOC_5H_4N$ (Methanone, (2-iodophenyl)-2-pyridinyl-)	XXXXXX-XX-X		9.06	EI	5459
$C_{12}H_9NO^+$	$C_{12}H_8NOH$ (Methanone, (2-nitrophenyl)-2-pyridinyl-)	27693-37-4	**	7.29	EI	5459
	$C_6H_5COC_5H_4N$ (Methanone, phenyl-2-pyridinyl-)	91-02-1	**	9.06	EI	5459
			**	9.1 ± 0.1	EI	5493
	$C_6H_5COC_5H_4N$ (Methanone, phenyl-3-pyridinyl-)	5424-19-1	**	9.6 ± 0.1	EI	5493

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{12}H_9NO^+$	$C_6H_5COC_6H_5N$ (Methanone, phenyl-4-pyridinyl-)	14548-46-0	**	9.6 ± 0.1	EI	5493
$C_{12}H_{11}NO^+$	$C_6H_5COC_6H_5NCH_3$ (Methanone, (1-methyl-1H-pyrrol-2-yl)phenyl-)	37496-06-3	**	8.7 ± 0.1	EI	5493
$C_{12}H_{13}NO^+$	$C_6H_5(CN)CO(CH_2)_3CH_3$ (Benzonitrile, 4-(1-oxopentyl)-)	30611-20-2	**	9.57 (V)	PE	4804
	$C_6H_5O(CH_2CH_2)_2C_6H_5NH$ (13-Oxa-14-azatricyclo[8.2.1.1 ^{1,7}]tetradeca-4,6,10,12-tetraene)	73650-94-9	**	7.22	PE	5575
	$C_5H_8NCOC_6H_5$ (Pyridine, 1-benzoyl-1,2,3,4-tetrahyro-)	50838-24-9	**	8.4	EI	4046
$C_{12}H_{15}NO^+$	$C_5H_{10}NCOC_6H_5$ (Piperidine, 1-benzoyl-)	776-75-0	**	8.8	EI	4046
$C_{12}H_{16}NO^+$	$C_6H_5CINHCOCH_2C(CH_3)_3$ (Butanamide, N-(2-chlorophenyl)-3,3-dimethyl-)	XXXXX-XX-X Cl		9.40	EI	4834
$C_{12}H_{18}NO^+$	$C_{13}H_{21}NO$ (4-Quinolinol, 4-ethynyldecahydro-1,2-dimethyl-(2 α ,4 α ,4 α ,8 α β))	16067-80-4	CH_3	9.35	EI	5598
	$C_{13}H_{21}NO$ (4-Quinolinol, 4-ethynyldecahydro-1,2-dimethyl-(2 α ,4 α ,4 α ,8 α β))	16067-45-1	CH_3	9.15	EI	5452
	$C_{13}H_{21}NO$ (4-Quinolinol, 4-ethynyldecahydro-1,2-dimethyl-(2 α ,4 β ,4 α ,8 α β))	14788-65-9	CH_3	9.33	EI	5452
$C_{12}H_{20}NO^+$	$C_{13}H_{23}NO$ (4-Quinolinol, 4-ethenyldecahydro-1,2-dimethyl-(2 α ,4 α ,4 α ,8 α β))	20431-93-0	CH_3	9.17	EI	5598
	$C_{13}H_{23}NO$ (4-Quinolinol, 4-ethenyldecahydro-1,2-dimethyl-(2 α ,4 α ,4 α ,8 α β))	20431-91-8	CH_3	8.98	EI	5452
	$C_{13}H_{23}NO$ (4-Quinolinol, 4-ethenyldecahydro-1,2-dimethyl-(2 α ,4 β ,4 α ,8 α β))	20431-95-2	CH_3	9.14	EI	5452
$C_{12}H_{21}NO^+$	$C_4(=O)(CH_3)_4(=NC_4H_9)$ (Cyclobutanone, 3-(butylimino)-2,2,4,4-tetramethyl-)	23458-49-3	**	8.63 (V)	PE	5499
$C_{12}H_{22}NO^+$	$C_{13}H_{25}NO$ (4-Quinolinol, 4-ethyldecahydro-1,2-dimethyl-(2 α ,4 α ,4 α ,8 α β))	20422-68-8	CH_3	9.00	EI	5452
	$C_{13}H_{25}NO$ (4-Quinolinol, 4-ethyldecahydro-1,2-dimethyl-(2 α ,4 α ,4 α ,8 α β))	20422-70-2	CH_3	9.04	EI	5598
	$C_{13}H_{25}NO$ (4-Quinolinol, 4-ethyldecahydro-1,2-dimethyl-(2 α ,4 β ,4 α ,8 α β))	20422-72-4	CH_3	9.15	EI	5452
	$C_{13}H_{27}NO$ (4-Quinolinol, 1,4-diethyldecahydro-2-methyl-(2 α ,4 α ,4 α ,8 α β))	38463-60-4	C_2H_5	9.85	EI	5452
	$C_{13}H_{27}NO$ (4-Quinolinol, 1,4-diethyldecahydro-2-methyl-(2 α ,4 α ,4 α ,8 α β))	38463-62-6	C_2H_5	9.80 ± 0.02	EI	5598
	$C_{13}H_{27}NO$ (4-Quinolinol, 1,4-diethyldecahydro-2-methyl-(2 α ,4 β ,4 α ,8 α β))	38463-61-5	C_2H_5	9.90	EI	5452
$C_{12}H_{24}NO^+$	$C_{17}H_{32}N_2O_5$ (L-Serine, N-[N-(1-oxodecyl)-L-alanyl]-methyl ester)	55728-15-9		9.5 ± 0.1	PI	5279
	$C_{20}H_{37}N_3O_5$ (L-Alanine, N-[N-[N-(1-oxodecyl)-L-alanyl]-L-alanyl]-methyl ester)	55728-11-5		9.0 ± 0.1	PI	5279

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{12}H_{21}NO^+$	$C_{23}H_{43}N_3O_5$ (L-Alanine, N-[N-[N-(1-oxodecyl)-L-alanyl]-L-leucyl]-methyl ester)	55728-12-6		9.0 ± 0.1	PI	5279
$C_{12}H_{25}NO^+$	$C_{17}H_{32}N_2O_5$ (L-Serine, N-[N-(1-oxodecyl)-L-alanyl]-methyl ester)	55728-15-9		9.4 ± 0.1	PI	5279
$C_{13}H_9NO^+$	$C_{11}H_9NO$ (Acridine 10-oxide)	10399-73-2	**	7.45 ± 0.02 (V)	PE	4551
$C_{13}H_{10}NO^+$	$C_6H_5COC_6H_4NH_2$ (Methanone, (2-aminophenyl)phenyl-)	2835-77-0	H	10.6 ± 0.1	EI	4358
$C_{13}H_{11}NO^+$	$C_{11}H_8(CN)(OCH_3)$ (1,4-Methanonaphthalene-2-carbonitrile, 1,4-dihydro-5-methoxy-)	71906-50-8	**	8.46 (V)	PE	4835
$C_{13}H_{11}NO^+$	$C_{11}H_8(CN)(OCH_3)$ (1,4-Methanonaphthalene-2-carbonitrile, 1,4-dihydro-8-methoxy-)	71906-48-4	**	8.44 (V)	PE	4835
$C_{13}H_{11}NO^+$	$C_{11}H_9(CN)(OCH_3)$ (1,4-Methanonaphthalene-2-carbonitrile, 1,4-dihydro-6-methoxy-)	71906-42-8	**	8.22 (V)	PE	4835
$C_{13}H_{11}NO^+$	$C_6H_5CH=N(O)C_6H_5$ (Benzenemethanimine, α -phenyl-N-oxide)	59862-61-2	**	7.75 (V)	PE	5590
$C_{13}H_{11}NO^+$	$C_6H_5COC_6H_4NH_2$ (Methanone, (2-aminophenyl)phenyl-)	2835-77-0	**	8.25 ± 0.1	EI	4358
$C_{13}H_{11}NO^+$	$C_6H_5COC_6H_4NH_2$ (Methanone, (3-aminophenyl)phenyl-)	2835-78-1	**	8.25 ± 0.1	EI	4335
$C_{13}H_{11}NO^+$	$C_6H_5COC_6H_4NH_2$ (Methanone, (3-aminophenyl)phenyl-)	2835-78-1	**	8.45 ± 0.1	EI	4335
$C_{13}H_{11}NO^+$	$C_6H_5COC_6H_4NH_2$ (Methanone, (4-aminophenyl)phenyl-)	1137-41-3	**	8.45 ± 0.1	EI	4358
$C_{13}H_{11}NO^+$	$C_6H_5COC_6H_4NH_2$ (Methanone, (4-aminophenyl)phenyl-)	1137-41-3	**	8.4 ± 0.1	EI	4358
$C_{13}H_{11}NO^+$	$C_6H_5COC_6H_4NH_2$ (Methanone, (4-aminophenyl)phenyl-)	1137-41-3	**	8.4 ± 0.1	EI	4335
$C_{13}H_{11}NO^+$	$C_6H_5COC_6H_4NH_2$ (Methanone, (4-aminophenyl)phenyl-)	1137-41-3	**	8.4 ± 0.1	EI	4335
$C_{13}H_{11}NO^+$	$C_6H_5COC_6H_4NH_2$ (Methanone, (4-aminophenyl)phenyl-)	1137-41-3	**	8.4 ± 0.1	EI	4335
$C_{13}H_{11}NO^+$	$C_6H_5COC_6H_4NH_2$ (Methanone, (4-aminophenyl)phenyl-)	1137-41-3	**	8.4 ± 0.1	EI	4335
$C_{13}H_{11}NO^+$	$C_6H_5COC_6H_4NH_2$ (Methanone, (4-aminophenyl)phenyl-)	1137-41-3	**	8.4 ± 0.1	EI	4335
$C_{13}H_{11}NO^+$	$C_6H_5COC_6H_4NH_2$ (Methanone, (4-aminophenyl)phenyl-)	1137-41-3	**	8.4 ± 0.1	EI	4335
$C_{13}H_{11}NO^+$	$C_6H_5COC_6H_4NH_2$ (Methanone, (4-aminophenyl)phenyl-)	1137-41-3	**	8.4 ± 0.1	EI	4335
$C_{13}H_{11}NO^+$	$C_6H_5COC_6H_4NH_2$ (Methanone, (4-aminophenyl)phenyl-)	1137-41-3	**	8.4 ± 0.1	EI	4335
$C_{13}H_{11}NO^+$	$C_6H_5COC_6H_4NH_2$ (Methanone, (4-aminophenyl)phenyl-)	1137-41-3	**	8.4 ± 0.1	EI	4335
$C_{13}H_{11}NO^+$	$C_6H_5COC_6H_4NH_2$ (Methanone, (4-aminophenyl)phenyl-)	1137-41-3	**	8.4 ± 0.1	EI	4335
$C_{13}H_{11}NO^+$	$C_6H_5COC_6H_4NH_2$ (Methanone, (4-aminophenyl)phenyl-)	1137-41-3	**	8.4 ± 0.1	EI	4335
$C_{13}H_{11}NO^+$	$C_6H_5COC_6H_4NH_2$ (Methanone, (4-aminophenyl)phenyl-)	1137-41-3	**	8.4 ± 0.1	EI	4335
$C_{13}H_{11}NO^+$	$C_6H_5COC_6H_4NH_2$ (Methanone, (4-aminophenyl)phenyl-)	1137-41-3	**	8.4 ± 0.1	EI	4335
$C_{13}H_{11}NO^+$	$C_6H_5COC_6H_4NH_2$ (Methanone, (4-aminophenyl)phenyl-)	1137-41-3	**	8.4 ± 0.1	EI	4335
$C_{13}H_{11}NO^+$	$C_6H_5COC_6H_4NH_2$ (Methanone, (4-aminophenyl)phenyl-)	1137-41-3	**	8.4 ± 0.1	EI	4335
$C_{13}H_{11}NO^+$	$C_6H_5COC_6H_4NH_2$ (Methanone, (4-aminophenyl)phenyl-)	1137-41-3	**	8.4 ± 0.1	EI	4335
$C_{13}H_{11}NO^+$	$C_6H_5COC_6H_4NH_2$ (Methanone, (4-aminophenyl)phenyl-)	1137-41-3	**	8.4 ± 0.1	EI	4335
$C_{13}H_{11}NO^+$	$C_6H_5COC_6H_4NH_2$ (Methanone, (4-aminophenyl)phenyl-)	1137-41-3	**	8.4 ± 0.1	EI	4335
$C_{13}H_{11}NO^+$	$C_6H_5COC_6H_4NH_2$ (Methanone, (4-aminophenyl)phenyl-)	1137-41-3	**	8.4 ± 0.1	EI	4335
$C_{13}H_{11}NO^+$	$C_6H_5COC_6H_4NH_2$ (Methanone, (4-aminophenyl)phenyl-)	1137-41-3	**	8.4 ± 0.1	EI	4335
$C_{13}H_{11}NO^+$	$C_6H_5COC_6H_4NH_2$ (Methanone, (4-aminophenyl)phenyl-)	1137-41-3	**	8.4 ± 0.1	EI	4335
$C_{13}H_{11}NO^+$	$C_6H_5COC_6H_4NH_2$ (Methanone, (4-aminophenyl)phenyl-)	1137-41-3	**	8.4 ± 0.1	EI	4335
$C_{13}H_{11}NO^+$	$C_6H_5COC_6H_4NH_2$ (Methanone, (4-aminophenyl)phenyl-)	1137-41-3	**	8.4 ± 0.1	EI	4335
$C_{13}H_{11}NO^+$	$C_6H_5COC_6H_4NH_2$ (Methanone, (4-aminophenyl)phenyl-)	1137-41-3	**	8.4 ± 0.1	EI	4335
$C_{13}H_{11}NO^+$	$C_6H_5COC_6H_4NH_2$ (Methanone, (4-aminophenyl)phenyl-)	1137-41-3	**	8.4 ± 0.1	EI	4335
$C_{13}H_{11}NO^+$	$C_6H_5COC_6H_4NH_2$ (Methanone, (4-aminophenyl)phenyl-)	1137-41-3	**	8.4 ± 0.1	EI	4335
$C_{13}H_{11}NO^+$	$C_6H_5COC_6H_4NH_2$ (Methanone, (4-aminophenyl)phenyl-)	1137-41-3	**	8.4 ± 0.1	EI	4335
$C_{13}H_{11}NO^+$	$C_6H_5COC_6H_4NH_2$ (Methanone, (4-aminophenyl)phenyl-)	1137-41-3	**	8.4 ± 0.1	EI	4335
$C_{13}H_{11}NO^+$	$C_6H_5COC_6H_4NH_2$ (Methanone, (4-aminophenyl)phenyl-)	1137-41-3	**	8.4 ± 0.1	EI	4335
$C_{13}H_{11}NO^+$	$C_6H_5COC_6H_4NH_2$ (Methanone, (4-aminophenyl)phenyl-)	1137-41-3	**	8.4 ± 0.1	EI	4335
$C_{13}H_{11}NO^+$	$C_6H_5COC_6H_4NH_2$ (Methanone, (4-aminophenyl)phenyl-)	1137-41-3	**	8.4 ± 0.1	EI	4335
$C_{13}H_{11}NO^+$	$C_6H_5COC_6H_4NH_2$ (Methanone, (4-aminophenyl)phenyl-)	1137-41-3	**	8.4 ± 0.1	EI	4335
$C_{13}H_{11}NO^+$	$C_6H_5COC_6H_4NH_2$ (Methanone, (4-aminophenyl)phenyl-)	1137-41-3	**	8.4 ± 0.1	EI	4335
$C_{13}H_{11}NO^+$	$C_6H_5COC_6H_$					

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₁₃H₂₂NO⁺	C ₁₃ H ₂₅ NO (4-Quinolinol,4-ethenyl-1-ethyldecahydro-2-methyl-(2 α ,4 α ,4 $\alpha\alpha$,8 $\alpha\beta$))	38463-57-9	CH ₃	9.23	EI	5598
	C ₁₃ H ₂₅ NO (4-Quinolinol,4-ethenyl-1-ethyldecahydro-2-methyl-(2 α ,4 β ,4 $\alpha\alpha$,8 $\alpha\beta$))	38463-58-0	CH ₃	9.20	EI	5598
	C ₁₃ H ₂₅ NO (4-Quinolinol,4-ethenyl-1-ethyldecahydro-2-methyl-(2 α ,4 α ,4 $\alpha\beta$,8 $\alpha\alpha$))	38463-59-1	CH ₃	9.06	EI	5598
C₁₃H₂₃NO⁺	C ₁₃ H ₂₃ NO (4-Quinolinol,4-ethenyldecahydro-1,2-dimethyl-(2 α ,4 α ,4 $\alpha\alpha$,8 $\alpha\beta$))	20431-93-0	**	7.43±0.02	EI	5598
	C ₃ H ₅ N(CH ₃) ₂ (OH)(CH=CH ₂)C ₄ H ₈ (4-Quinolinol,4-ethenyldecahydro-1,2-dimethyl-(2 α ,4 α ,4 $\alpha\beta$,8 $\alpha\alpha$))	20431-91-8	**	7.26±0.02	EI	5598
	C ₁₃ H ₂₃ NO (4-Quinolinol,4-ethenyldecahydro-1,2-dimethyl-(2 α ,4 β ,4 $\alpha\alpha$,8 $\alpha\beta$))	20431-95-2	**	7.39±0.02	EI	5598
C₁₃H₂₄NO⁺	C ₁₃ H ₂₇ NO (4-Quinolinol,1,4-diethyldecahydro-2-methyl-(2 α ,4 α ,4 $\alpha\alpha$,8 $\alpha\beta$))	38463-60-4	CH ₃	9.09	EI	5598
	C ₁₃ H ₂₇ NO (4-Quinolinol,1,4-diethyldecahydro-2-methyl-(2 α ,4 α ,4 $\alpha\beta$,8 $\alpha\alpha$))	38463-62-6	CH ₃	9.05	EI	5598
	C ₁₃ H ₂₇ NO (4-Quinolinol,1,4-diethyldecahydro-2-methyl-(2 α ,4 β ,4 $\alpha\alpha$,8 $\alpha\beta$))	38463-61-5	CH ₃	9.18	EI	5598
C₁₃H₂₅NO⁺	C ₁₃ H ₂₅ NO (4-Quinolinol,4-ethyldecahydro-1,2-dimethyl-(2 α ,4 α ,4 $\alpha\alpha$,8 $\alpha\beta$))	20422-70-2	**	7.30±0.02	EI	5598
	C ₃ H ₅ N(CH ₃) ₂ (OH)(C ₂ H ₅)C ₄ H ₈ (4-Quinolinol,4-ethyldecahydro-1,2-dimethyl-(2 α ,4 α ,4 $\alpha\beta$,8 $\alpha\alpha$))	20422-68-8	**	7.19±0.02	EI	5598
	C ₁₃ H ₂₅ NO (4-Quinolinol,4-ethyldecahydro-1,2-dimethyl-(2 α ,4 β ,4 $\alpha\alpha$,8 $\alpha\beta$))	20422-72-4	**	7.32±0.02	EI	5598
C₁₃H₁₁NO⁺	C ₁₃ H ₇ (=O)NHCH ₃ (Phenalen-1-one,9-methylamino-)	XXXXX-XX-X	**	7.41±0.04 (V)	PE	5595
C₁₄H₁₃NO⁺	C ₆ H ₅ (OCH ₃)C(=CH ₂)C ₅ H ₄ N (Pyridine,2-[1-(3-methoxyphenyl)ethenyl]-)	XXXXX-XX-X	**	8.27	EI	5570
	C ₆ H ₅ (OCH ₃)C(=CH ₂)C ₅ H ₄ N (Pyridine,2-[1-(4-methoxyphenyl)ethenyl]-)	XXXXX-XX-X	**	8.15	EI	5570
	C ₆ H ₅ (OCH ₃)CH=CHC ₅ H ₄ N (Pyridine, <i>trans</i> -3-[2-(4-methoxyphenyl)ethenyl]-)	5847-73-4	**	7.72±0.05 (V)	PE	4377
C₁₄H₁₅NO⁺	C ₆ H ₅ COC ₆ H ₄ N(CH ₃) ₂ (Benzenamine,N,N-dimethyl-4-(phenylmethanone)-)	XXXXX-XX-X	**	7.50±0.05	PI	5552
C₁₄H₁₉NO⁺	C ₁₃ H ₁₉ NO (8-Azabicyclo[3.2.1]octane,3-phenoxy- <i>endo</i> -)	XXXXX-XX-X	**	8.1±0.15	EI	5401
	C ₁₃ H ₁₉ NO (8-Azabicyclo[3.2.1]octane,3-phenoxy- <i>exo</i> -)	16487-31-3	**	8.2±0.15	EI	5401
C₁₄H₂₃NO⁺	C ₄ (=O)(CH ₃) ₃ (=NC ₆ H ₁₁) (Cyclobutanone, 3-(cyclohexylimino)-2,2,4,4-tetramethyl-)	54133-31-2	**	9.23 (V)	PE	5499
	C ₁₃ H ₂₃ NO (4-Quinolinol,1-ethyl-4-ethynyldecahydro-2-methyl-(2 α ,4 α ,4 $\alpha\alpha$,8 $\alpha\beta$))	38463-54-6	**	7.33±0.02	EI	5598
	C ₁₃ H ₂₃ NO (4-Quinolinol,1-ethyl-4-ethynyldecahydro-2-methyl-(2 α ,4 α ,4 $\alpha\beta$,8 $\alpha\alpha$))	38463-56-8	**	7.16±0.02	EI	5598
	C ₁₃ H ₂₃ NO (4-Quinolinol,1-ethyl-4-ethynyldecahydro-2-methyl-(2 α ,4 β ,4 $\alpha\alpha$,8 $\alpha\beta$))	38463-55-7	**	7.28±0.02	EI	5598

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₁₁H₂₅NO⁺	C ₁₁ H ₂₅ NO (4-Quinolinol,4-ethenyl-1-ethyldecahydro-2-methyl-(2 α ,4 α ,4 α ,8 α β))	38463-57-9	**	7.32 \pm 0.02	EI	5598
	C ₁₁ H ₂₅ NO (4-Quinolinol,4-ethenyl-1-ethyldecahydro-2-methyl-(2 α ,4 α ,4 α β ,8 α α))	38463-59-1	**	7.15 \pm 0.02	EI	5598
	C ₁₁ H ₂₅ NO (4-Quinolinol,4-ethenyl-1-ethyldecahydro-2-methyl-(2 α ,4 β ,4 α ,8 α β))	38463-58-0	**	7.30 \pm 0.02	EI	5598
C₁₄H₂₇NO⁺	C ₁₄ H ₂₇ NO (4-Quinolinol,1,4-diethyldecahydro-2-methyl-(2 α ,4 α ,4 α ,8 α β))	38463-60-4	**	7.24 \pm 0.02	EI	5598
	C ₁₄ H ₂₇ NO (4-Quinolinol,1,4-diethyldecahydro-2-methyl-(2 α ,4 α ,4 α β ,8 α α))	38463-62-6	**	7.09 \pm 0.02	EI	5598
	C ₁₄ H ₂₇ NO (4-Quinolinol,1,4-diethyldecahydro-2-methyl-(2 α ,4 β ,4 α ,8 α β))	38463-61-5	**	7.23 \pm 0.02	EI	5598
C₁₅H₁₁NO⁺	C ₉ H ₆ N(O)(C ₆ H ₅) (Isoquinolinium, 4-hydroxy-2-phenyl-hydroxide, inner salt)	56359-29-6	**	7.10 \pm 0.05	EI	4863
	C ₉ H ₆ N(=O)(C ₆ H ₅) (Indeno[1,2- <i>b</i>]azirin-6(1H)-one, 1a,6a-dihydro-1-phenyl-)	42299-62-7	**	8.13 \pm 0.05	EI	4863
	C ₉ H ₆ N ₃ (=O)(C ₆ H ₅) (Indeno[1,2- <i>d</i>]triazol-8(3H)-one, 3a,8a-dihydro-3-phenyl-)	55507-27-2	N ₂	8.1 \pm 0.1	EI	4863
C₁₅H₁₃NO⁺	C ₁₃ H ₇ (=O)N(CH ₃) ₂ (Phenalen-1-one,9-dimethylamino-)	XXXXX-XX-X	**	7.36 \pm 0.04 (V)	PE	5595
C₁₅H₃₀NO⁺	C ₁₉ H ₃₀ N ₂ O ₄ (Glycine,N-[N-(1-oxodecyl)-L-leucyl]-methyl ester)	55728-14-8		9.2 \pm 0.1	PI	5279
C₁₅H₃₁NO⁺	C ₁₉ H ₃₀ N ₂ O ₄ (Glycine,N-[N-(1-oxodecyl)-L-leucyl]-methyl ester)	55728-14-8		9.1 \pm 0.1	PI	5279
C₁₆H₁₃NO⁺	C ₉ H ₆ N ₃ (=O)(CH ₂ C ₆ H ₅) (Indeno[1,2- <i>d</i>]triazol-8(3H)-one, 3a,8a-dihydro-3-(phenylmethyl)-)	55527-79-2	N ₂	8.1 \pm 0.1	EI	4863
CH₄N₂O⁺	(NH ₂) ₂ CO	57-13-6	**	9.7	PE	4221
			**	10.15 (V)	PE	4471
			**	10.28 (V)	PE	4599
			**	10.33 (V)	PE	4469
C₂H₆N₂O⁺	(CH ₃) ₂ NNO	62-75-9	**	8.69	PE	4647
			**	9.05 (V)	PE	4451
			**	9.09 (V)	PE	4576
			**	9.66 (V)	PE	4599
	CH ₃ NHCONH ₂	598-50-5	**		PE	4599
	CH ₃ NN(O)CH ₃	54168-20-6	**	~10.07 \pm 0.03 (V)	PE	4691
C₃H₁N₂O⁺	CH ₃ C(=O)CHN ₂	2684-62-0	**	9.21 \pm 0.05 (V)	PE	5326
C₄H₈N₂O⁺	(CH ₃ NH) ₂ CO	96-31-1	**	9.23 (V)	PE	4599
	(CH ₃) ₂ NCONH ₂	598-94-7	**	8.96 (V)	PE	4599
C₄H₁N₂O⁺	C ₁ H ₁ N ₂ O	2423-65-6	**	9.17 \pm 0.02 (V)	PE	4470
	(Pyrazine, 1-oxide)					

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₄H₄N₂O⁺	C ₄ H ₄ N ₂ O (Pyridazine, 1-oxide)	1457-42-7	**	8.89±0.02	PE	4470
	C ₄ H ₄ N ₂ O (Pyrimidine, 1-oxide)	17043-94-6	**	8.80±0.02	PE	4470
	C ₄ H ₄ N ₂ (=O) (2(1H)-Pyrimidinone)	557-01-7	**	10.06±0.05	EI	5159
C₄H₆N₂O⁺	CH ₃ C(=O)C(CH ₃)N ₂	14088-58-5	**	8.76±0.05 (V)	PE	5326
	C(CH ₃) ₂ (CN)NO	44513-62-4	**	9.77±0.1 (V)	PE	4465
C₄H₁₀N₂O⁺	(CH ₃) ₂ NCONHCH ₃	632-14-4	**	8.80 (V)	PE	4599
	(CH ₃ CH ₂) ₂ NNO	55-18-5	**	8.76 (V)	PE	4576
	(Ethanamine, N-ethyl-N-nitroso-)					
C₅H₆N₂O⁺	C ₅ H ₆ N ₂ O (1H-Imidazole, 1-acetyl-)	2466-76-4	**	9.38 (V)	PE	5092
	C ₅ H ₆ N(O)NH ₂ (2-Pyridinamine 1-oxide)	14150-95-9	**	8.04±0.05	EI	4117
	C ₅ H ₆ N(O)NH ₂ (3-Pyridinamine 1-oxide)	1657-32-5	**	8.21±0.05	EI	4117
	C ₅ H ₆ N(O)NH ₂ (4-Pyridinamine 1-oxide)	3535-75-9	**	7.67±0.05	EI	4117
	C ₅ H ₆ N ₂ OCH ₃ (Pyrimidine, 2-methoxy-)	931-63-5	**	9.66±0.05	EI	5159
	C ₅ H ₆ N ₂ (=O)CH ₃ (2(1H)Pyrimidinone, 1-methyl-)	3739-81-9	**	9.31±0.05	EI	5159
C₅H₈N₂O⁺	C ₅ H ₈ N ₂ O (2,3-Diazabicyclo[2.2.1]hept-2-ene, 2-oxide)	22509-00-8	**	9.48±0.03 (V)	PE	4691
C₅H₁₀N₂O⁺	(CH ₃) ₂ NN=CHCOCH ₃	XXXXX-XX-X	**	8.06 (V)	PE	5548
	(CH ₃) ₂ NN=CHCH ₂ CHO	XXXXX-XX-X	**	8.08 (V)	PE	5548
	C ₅ H ₈ NCONH ₂	4736-71-4	**	8.92 (V)	PE	4803
	(1-Pyrrolidinecarboxamide)					
C₅H₁₂N₂O⁺	((CH ₃) ₂ N) ₂ CO	632-22-4	**	8.64 (V)	PE	4599
			**	8.67 (V)	PE	4469
C₆H₄N₂O⁺	C ₆ H ₄ N ₂ O (Benzofurazan)	273-09-6	**	9.37	PE	4017
	C ₆ H ₄ N ₂ O (1,2,3-Benzoxadiazole)	273-59-6	**	9.45 (V)	PE	5131
	C ₆ H ₄ (O)NN (2,4-Cyclohexadien-1-one, 6-diazo-)	4024-72-0	N ₂	9.5±0.01	EI	4317
	C ₆ H ₄ (O)NN (2,5-Cyclohexadien-1-one, 4-diazo-)	932-97-8	**	8.28±0.05	EI	4317
	C ₆ H ₄ N(O)CN (2-Pyridinecarbonitrile, 1-oxide)	2402-98-4	**	8.96±0.02 (V)	PE	4275
	C ₆ H ₄ N(O)CN (3-Pyridinecarbonitrile, 1-oxide)	14906-64-0	**	8.93±0.02 (V)	PE	4275
	C ₆ H ₄ N(O)CN (4-Pyridinecarbonitrile, 1-oxide)	14906-59-3	**	8.95±0.02 (V)	PE	4275
C₆H₆N₂O⁺	C ₆ H ₄ NCONH ₂ (3-Pyridinecarboxamide)	98-92-0	**	9.18	PE	5093

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₆H₈N₂O⁺	C ₅ H ₃ N(O)NHCH ₃ (2-Pyridinamine, <i>N</i> -methyl-, 1-oxide)	54818-70-1	**	7.67±0.05	EI	4117
	C ₅ H ₃ N(O)NHCH ₃ (3-Pyridinamine, <i>N</i> -methyl-, 1-oxide)	54818-71-2	**	7.97±0.05	EI	4117
	C ₅ H ₃ N(O)NHCH ₃ (4-Pyridinamine, <i>N</i> -methyl-, 1-oxide)	1122-92-5	**	7.45±0.05	EI	4117
	C ₅ H ₃ N(=NH)OCH ₃ (2(1 <i>H</i>)-Pyridinimine, 1-methoxy-)	54818-76-7	**	7.46±0.05	EI	4117
C₆H₁₀N₂O⁺	C ₆ H ₁₀ N ₂ O (2,3-Diazabicyclo[2.2.2]oct-2-ene 2-oxide)	25926-96-9	**	9.30±0.03 (V)	PE	4691
C₆H₁₄N₂O⁺	C ₆ H ₁₄ N ₂ O	35216-94-5	**	~9.60±0.03 (V)	PE	4691
	(CH ₃) ₂ CH ₂ NNO (2-Propanamine, <i>N</i> -(1-methylethyl)- <i>N</i> -nitroso-)	601-77-4	**	8.58 (V)	PE	4576
C₇H₇N₂O⁺	C ₆ H ₅ NHCONH ₂ (Urea, phenyl-)	64-10-8		9.50	EI	4834
	C ₆ H ₄ ClNHCONH ₂ (Urea, (2-chlorophenyl)-)	114-38-5	Cl	9.35	EI	4834
	C ₆ H ₄ BrNHCONH ₂ (Urea, (2-bromophenyl)-)	13114-90-4	Br	9.35	EI	4834
	C ₆ H ₄ INHCONH ₂ (Urea, (2-iodophenyl)-)	13114-93-7	I	9.15	EI	4834
C₇H₈N₂O⁺	C ₆ H ₅ (CH ₃)NNO (Benzenamine, <i>N</i> -methyl- <i>N</i> -nitroso-)	614-00-6	**	9.01 (V)	PE	4576
	C ₆ H ₅ NHCONH ₂ (Urea, phenyl-)	64-10-8	**	8.55	EI	4834
C₇H₁₀N₂O⁺	C ₅ H ₃ N(O)N(CH ₃) ₂ (2-Pyridinamine, <i>N,N</i> -dimethyl-, 1-oxide)	3618-79-9	**	7.62±0.05	EI	4117
	C ₅ H ₃ N(O)N(CH ₃) ₂ (3-Pyridinamine, <i>N,N</i> -dimethyl-, 1-oxide)	36100-40-0	**	7.85±0.05	EI	4117
	C ₅ H ₃ N(O)N(CH ₃) ₂ (4-Pyridinamine, <i>N,N</i> -dimethyl-, 1-oxide)	1005-31-8	**	7.21±0.05 (V)	PE	4275
			**	7.32±0.05	EI	4117
C₇H₁₂N₂O⁺	C ₇ H ₁₂ NNO (2-Azabicyclo[2.2.2]octane, 2-nitroso)	21744-12-7	**	8.72 (V)	PE	4576
	C ₇ H ₁₂ N ₂ O (6,7-Diazabicyclo[3.2.2]non-6-ene 6-oxide)	26081-83-4	**	9.21±0.03 (V)	PE	4691
	C ₃ N ₂ (=O)(CH ₃) ₄ (4 <i>H</i> -Pyrazole-4-one, 3,5-dihydro-3,3,5,5-tetramethyl-)	30467-62-0	**	8.61 (V)	PE	4429
	C ₇ H ₁₄ N ₂ O (1 <i>H</i> -Pyridazino[1,2- <i>c</i>][1,3,4]oxadiazine, hexahydro-)	73569-74-1	**	8.04 (V)	PE	5215
C₈H₆N₂O⁺	C ₆ H ₅ (CN)(CONH ₂) (Benzamide, 4-cyano-)	3034-34-2	**	9.99 (V)	PE	4918
	C ₆ H ₅ C(=O)CHN ₂ (Ethanone, 2-diazo-1-phenyl-)	3282-32-4	**	8.93±0.05 (V)	PE	5326
	C ₈ H ₆ N ₂ O (Quinoxaline, 1-oxide)	6935-29-1	**	8.62±0.02 (V)	PE	4551

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_8H_9N_2O^+$	$C_6H_4ClNHCONHCH_3$ (Urea, N-(2-chlorophenyl)-N'-methyl-)	15500-96-6	Cl	9.35	EI	4834
$C_8H_{10}N_2O^+$	$C_6H_5NO(N(CH_3)_2)$ (Benzenamine, N,N-dimethyl-4-nitroso-)	138-89-6	**	7.2 ± 0.1	PE	4401
	$C_6H_5(NH_2)NHCOCH_3$ (Acetamide, N-(2-aminophenyl)-)	34801-09-7	**	7.78 ± 0.1 (V)	PE	4465
	$C_6H_5(NH_2)NHCOCH_3$ (Acetamide, N-(4-aminophenyl)-)	122-80-5	**	7.39 ± 0.02	EI	3631
	$C_6H_5NHCONHCH_3$ (Urea, N-methyl-N'-phenyl-)	1007-36-9	**	7.12 ± 0.02	EI	3631
				8.50 ± 0.05	EI	4834
$C_8H_{12}N_2O^+$	$C_9H_{12}N_2(=O)$ (1,3-Diazatricyclo[3.3.1.1 ^{3,7}]decan-6-one)	20397-57-3	**	8.25 (V)	PE	4659
$C_8H_{14}N_2O^+$	$(CH_3)CH=NN(C_2H_5)CH=CHCOCH_3$ $(CH_3)_2C=NN(CH_3)CH=CHCOCH_3$	XXXXXX-XX-X	**	7.79 (V)	PE	5548
	$C_6H_4N_2O$ (7,8-Diazabicyclo[4.2.2]dec-7-ene 7-oxide)	63262-98-6	**	7.78 (V)	PE	5548
		25926-97-0	**	9.13 ± 0.03 (V)	PE	4691
$C_8H_{16}N_2O^+$	$C_4H_4N_2(O)(CH_3)_4$ (Pyridazine, 3,4,5,6-tetrahydro-3,3,6,6-tetramethyl-1-oxide)	54143-34-9	**	$\sim 9.13 \pm 0.03$ (V)	PE	4691
$C_9H_8N_2O^+$	$C_6H_5(CN)CHN(O)CH_3$ (Benzonitrile, 4-[(methylimino)methyl]-N'-oxide)	16089-70-6	**	8.35 ± 0.02 (V)	PE	4674
	$CH_3C_6H_4C(=O)CHN_2$ (Ethanone, 2-diazo-1-(4-methylphenyl)-)	17263-64-8	**	8.80 ± 0.05 (V)	PE	5326
	$C_6H_5C(=O)C(CH_3)N_2$ (1-Propanone, 2-diazo-1-phenyl-)	14088-57-4	**	8.52 ± 0.05 (V)	PE	5326
$C_9H_{11}N_2O^+$	$C_6H_5(Cl)(N(CH_3)_2)NHCHO$ (Formamide, N-[2-chloro-5-(dimethylamino)phenyl]-)	53666-46-9	Cl	9.7 ± 0.1	EI	4359
	$C_6H_4ClNHCONHC_2H_5$ (Urea, N-(2-chlorophenyl)-N'-ethyl-)	62635-53-4	Cl	9.30	EI	4834
$C_9H_{12}N_2O^+$	$C_6H_5NHCONHC_2H_5$ (Urea, N-ethyl-N'-phenyl-)	621-04-5	**	8.25 ± 0.05	EI	4834
$C_9H_{14}N_2O^+$	$C_6H_{14}N_2O$ (1-Pyrrolidinecarboxamide, N-1,3-butadienyl-(E)-)	61759-62-4	**	7.90 (V)	PE	4803
$C_{10}H_{13}N_2O^+$	$C_6H_5(OCH_3)N=CHN(CH_3)_2$ (Methanimidamide, N'-(3-methoxyphenyl)-N,N-dimethyl-)	1202-42-2	H	9.2 ± 0.1	EI	4359
	$C_6H_5(OCH_3)N=CHN(CH_3)_2$ (Methanimidamide, N'-(4-methoxyphenyl)-N,N-dimethyl-)	1202-62-6	H	9.3 ± 0.1	EI	4359
	$C_6H_5(Cl)(OCH_3)N=CHN(CH_3)_2$ (Methanimidamide, N'-(2-chloro-4-methoxyphenyl)-N,N-dimethyl-)	53666-34-5	Cl	8.9 ± 0.1	EI	4359
	$C_6H_5(Cl)(OCH_3)N=CHN(CH_3)_2$ (Methanimidamide, N'-(2-chloro-5-methoxyphenyl)-N,N-dimethyl-)	53666-40-3	Cl	8.7 ± 0.1	EI	4359
	$C_6H_4ClNHCONHCH(CH_3)_2$ (Urea, N-(2-chlorophenyl)-N'-(1-methylethyl)-)	62635-47-6	Cl	9.20	EI	4834

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₁₀H₁₁N₂O⁺	C ₆ H ₅ (OCH ₃)N=CHN(CH ₃) ₂ (Methanimidamide, <i>N'</i> -(3-methoxyphenyl)- <i>N,N</i> -dimethyl-)	1202-42-2		7.2±0.1	EI	4359
	C ₆ H ₅ (OCH ₃)N=CHN(CH ₃) ₂ (Methanimidamide, <i>N'</i> -(4-methoxyphenyl)- <i>N,N</i> -dimethyl-)	1202-62-6	**	6.9±0.1	EI	4359
	C ₅ H ₅ NCON(C ₂ H ₅) ₂ (3-Pyridinecarboxamide, <i>N,N</i> -diethyl-)	59-26-7	**	8.65	PE	5093
	C ₆ H ₅ NHCONHCH(CH ₃) ₂ (Urea, <i>N</i> -(1-methylethyl)- <i>N'</i> -phenyl-)	19895-44-4	**	8.20±0.05	EI	4834
C₁₀H₁₈N₂O⁺	C ₁₀ H ₁₈ N ₂ O	51884-33-4	**	8.36±0.05 (V)	PE	5326
C₁₀H₂₂N₂O⁺	C ₂ H ₄ N ₂ O(C ₆ H ₄) ₂ (1,3,4-Oxadiazolidine, 3,4-bis(1,1-dimethylethyl)-)	38786-33-3	**	8.15 (V)	PE	3889
C₁₁H₈N₂O⁺	C ₆ H ₅ COC ₄ H ₃ N ₂ (Methanone, phenylpyrazinyl-)	3430-09-9	**	9.4±0.1	EI	5493
	C ₆ H ₅ COC ₄ H ₃ N ₂ (Methanone, phenyl-4-pyrimidinyl-)	68027-80-5	**	9.4±0.1	EI	5493
C₁₁H₁₄N₂O⁺	C ₁₀ H ₁₃ (CN)(NO) (Tricyclo[3.3.1.1 ^{3,7}]decane-2-carbonitrile, 2-nitroso-)	60038-41-7	**	9.22 (V)	PE	4465
	C ₆ H ₄ (OCH ₃)CH ₂ C ₆ H ₃ N ₂ (1 <i>H</i> -imidazole, 4,5-dihydro-2-[(4-methoxyphenyl)methyl]-)	71609-39-7	**	8.60 (V)	PE	5096
	C ₈ H ₅ N(OCH ₃)CH ₂ CH ₂ NH ₂ (1 <i>H</i> -Indole-3-ethanamine, 5-methoxy-)	608-07-1	**	7.68±0.12 (V)	PE	4672
C₁₁H₁₅N₂O⁺	C ₆ H ₄ ClNHCONHC(CH ₃) ₃ (Urea, <i>N</i> -(2-chlorophenyl)- <i>N'</i> -(1,1-dimethylethyl)-)	62635-48-7	Cl	9.10	EI	4834
C₁₁H₁₆N₂O⁺	C ₆ H ₅ NHCONHC(CH ₃) ₃ Urea, <i>N</i> -(1,1-dimethylethyl)- <i>N'</i> -phenyl-)	15054-54-3	**	8.10±0.05	EI	4834
C₁₂H₈N₂O⁺	C ₁₂ H ₈ N ₂ O (Phenazine, 5-oxide)	304-81-4	**	8.00±0.02 (V)	PE	4551
			**	8.10 (V)	PE	4590
C₁₂H₁₀N₂O⁺	C ₆ H ₅ N=N(O)C ₆ H ₅	XXXXX-XX-X	**	8.55 (V)	PE	5590
	C ₆ H ₅ NNC ₆ H ₄ OH (Phenol, 4-(phenylazo)-(E)-)	20714-70-9	**	8.2±0.05 (V)	PE	5320
	C ₁₁ H ₆ N ₂ (OH)CH ₃ (9 <i>H</i> -Pyrido[3,4- <i>b</i>]indol-7-ol, 1-methyl-)	487-03-6	**	7.92±0.06 (V)	PE	4758
C₁₂H₁₂N₂O⁺	(C ₆ H ₄ NH ₂) ₂ O (Benzenamine, 4,4'-oxybis-)	101-80-4	**	6.55	PI	4328
C₁₃H₁₀N₂O⁺	C ₁₂ H ₇ N ₂ OCH ₃ (Phenazine, 2-methyl-10-oxide)	26730-04-1	**	7.90 (V)	PE	4590
C₁₃H₁₂N₂O⁺	C ₆ H ₅ NNC ₆ H ₄ OCH ₃ (Diazene, (4-methoxyphenyl)phenyl-(E)-)	21650-49-7	**	8.0±0.05 (V)	PE	5320

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{13}H_{12}N_2O^+$	$C_{11}H_8N_2(CH_3)OCH_3$ (9H-Pyrido[3,4- <i>b</i>]indole, 7-methoxy-1-methyl-)	442-51-3	**	7.78 ± 0.06 (V)	PE	4758
$C_{13}H_{14}N_2O^+$	$C_{11}H_8N_2(CH_3)OCH_3$ (3H-Pyrido[3,4- <i>b</i>]indole, 4,9-dihydro-7-methoxy-1-methyl-)	304-21-2	**	7.38 ± 0.06 (V)	PE	4758
$C_{13}H_{18}N_2O^+$	$C_{13}H_{18}N_2O$ (1H-Indole-3-ethanamine 5-methoxy-N,N-dimethyl-)	1019-45-0	**	7.61 ± 0.14 (V)	PE	4672
$C_{11}H_{10}N_2O^+$	$C_6H_5C(=O)C(C_6H_5)N_2$ (Ethanone,diazodiphenyl-)	3469-17-8	**	7.79 ± 0.05 (V)	PE	5326
$C_{16}H_{24}N_2O^+$	$C_{16}H_{24}N_2O$ (Phenol,3-[4,5-dihydro-1H-imidazol-2-yl)methyl]-6-(1,1-dimethylethyl)- -2,4-dimethyl-)	1491-59-4	**	8.36 (V)	PE	5096
$C_{17}H_{20}N_2O^+$	$(C_6H_5N(CH_3)_2)_2CO$ (Methanone, diphenyl-, bis(dimethylamino)deriv.)	58211-66-8	**	7.25 ± 0.1	PI	4028
$C_{20}H_{20}N_2O^+$	$C_8H_{10}N_2(=O)(C_6H_5)_2$ (1,3-Diazatricyclo[3.3.1.1 ^{3,7}]decan-6-one, 5,7-diphenyl-)	19066-35-4	**	7.87 ± 0.03 (V)	PE	4163
$C_{20}H_{22}N_2O^+$	$C_8H_{11}N_2(OH)(C_6H_5)_2$ (1,3-Diazatricyclo[3.3.1.1 ^{3,7}]decan-6-ol, 5,7-diphenyl-)	3576-75-8	**	7.51 ± 0.03 (V)	PE	4163
$C_2H_3N_3O^+$	$C_2H_3N_3(=O)$ (3H-1,2,4-Triazol-3-one,1,2-dihydro-)	930-33-6	**	9.18 (V)	PE	4439
$C_3H_5N_3O^+$	$C_2H_2N_3(=O)(CH_3)$ (3H-1,2,4-Triazol-3-one,1,2-dihydro-5-methyl-)	930-63-2	**	8.76 (V)	PE	4439
$C_4H_5N_3O^+$	$C_4H_5N_2(=O)(NH_2)$ (2(1H)-Pyrimidinone,4-amino-)	71-30-7	**	8.45	PE	5093
			**	8.94 ± 0.03 (V)	PE	4445
			**	9.0 ± 0.1	EI	5555
$C_4H_7N_3O^+$	$C_2HN_3(=O)(CH_3)_2$ (3H-1,2,4-Triazol-3-one,2,4-dihydro-2,5-dimethyl-)	4114-21-0	**	8.62 (V)	PE	4439
	$C_2HN_3(=O)(CH_3)_2$ (3H-1,2,4-Triazol-3-one,2,4-dihydro-4,5-dimethyl-)	54770-19-3	**	8.69 (V)	PE	4439
$C_5H_3N_3O^+$	$C_5H_3N(O)NN$ (2(3 <i>H</i>)-Pyridinone, 3-diazo-)	XXXXX-XX-X	**	8.80 ± 0.05	EI	4316
	$C_5H_3N(O)NN$ (2(5 <i>H</i>)-Pyridinone, 5-diazo-)	XXXXX-XX-X	**	8.93 ± 0.05	EI	4316
	$C_5H_3N(O)NN$ (4(3 <i>H</i>)-Pyridinone, 3-diazo-)	54459-88-0	**	9.00 ± 0.05	EI	4316

Table of Ion Energetics Measurements—Continued

Ion	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₅H₇N₃O⁺	C ₅ H ₂ N ₂ (CH ₃)(=O)NH ₂ (2(1H)-Pyrimidinone,4-amino-1-methyl-)	1122-47-0	**	8.65 (V)	PE	5594
	C ₅ HN ₂ H(CH ₃)(=O)NH ₂ (2(1H)-Pyrimidinone,4-amino-5-methyl-)	554-01-8	**	9.5±0.1 8.78 (V)	EI PE	5555 5594
	C ₅ HN ₂ H(CH ₃)(=O)NH ₂ (2(1H)-Pyrimidinone,4-amino-6-methyl-)	6220-50-4	**	8.73 (V)	PE	5594
	C ₅ H ₂ N ₂ H(CH ₃)(=O)NH (2(1H)-Pyrimidinone,4-imino-3-methyl-)	XXXXX-XX-X	**	8.72 (V)	PE	5594
C₅H₉N₃O⁺	C ₂ N ₃ (=O)(CH ₃) ₃ (3H-1,2,4-Triazol-3-one,2,4-dihydro-2,4,5-trimethyl-)	57626-52-5	**	8.39 (V)	PE	4439
C₆H₉N₃O⁺	C ₅ H ₂ N ₂ (=O)(NH(CH ₃))(CH ₃) (2(1H)Pyrimidinone,4-amino-1,N-dimethyl-)	XXXXX-XX-X	**	9.25±0.1	EI	5555
	C ₅ HN ₂ (CH ₃) ₂ (=O)NH ₂ (2(1H)-Pyrimidinone,4-amino-1,5-dimethyl-)	17634-60-5	**	8.50 (V)	PE	5594
	C ₅ HN ₂ (CH ₃) ₂ (=O)NH ₂ (2(1H)-Pyrimidinone,4-amino-1,6-dimethyl-)	66943-92-8	**	8.41 (V)	PE	5594
	C ₅ H ₂ N ₂ (CH ₃)(=O)NHCH ₃ (2(1H)-Pyrimidinone,1-methyl-4-(methyldamino)-)	6220-49-1	**	8.58 (V)	PE	5594
C₇H₁₁N₃O⁺	C ₅ H ₂ N ₂ (=O)(N(CH ₃) ₂)(CH ₃) (2(1H)Pyrimidinone,4-(dimethylamino)-1-methyl-)	2228-27-5	**	8.7±0.1	EI	5555
C₁₃H₇N₃O⁺	C ₁₂ H ₇ N ₂ OCN (2-Phenazinedicarbonitrile-10-oxide)	59019-84-0	**	8.44 (V)	PE	4590
C₂₀H₂₅N₃O⁺	C ₂₀ H ₂₅ N ₃ O		**	7.25±0.10 (V)	PE	4672
C₅H₄N₄O⁺	C ₅ H ₄ N ₄ (=O) (6H-Purin-6-one,1,7-dihydro-)	68-94-0	**	8.55±0.03 (V)	PE	4445
C₅H₅N₅O⁺	C ₅ H ₄ N ₄ (=O)(NH ₂) (6H-Purin-6-one,2-amino-1,7-dihydro-)	73-40-5	**	7.85	PE	5093
			**	8.70	PE	5093
			**	8.24±0.03 (V)	PE	4445
			**	8.0±0.2	EI	5555
CH₃NO₂⁺	CH ₃ NO ₂	75-52-5	**	11.040±0.017	PI	3524
			**	11.07±0.01	PE	3721
			**	11.29 (V)	PE	5272
			**	11.31±0.015 (V)	PE	4107
			**	11.31 (V)	PE	4884
			**	11.8 (V)	PE	4467
	CH ₃ ONO	624-91-9	**	10.475±0.007	PI	3524
			**	11.0	PE	4379
CD₃NO₂⁺	CD ₃ NO ₂	13031-32-8	**	11.08±0.01	PE	3721
C₂H₃NO₂⁺	CH ₂ (NH ₂)COOH	56-40-6	**	8.8	PE	4221

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_2H_5NO_2^+$	$CH_3(NH_2)COOH$	56-40-6	**	9.21 ± 0.05	EI	3571
$C_3H_5NO_2^+$	$CH_3COCONH_2$	631-66-3	**	9.71 (V)	PE	4520
	$C_3H_5NO(=O)$	497-25-6	**	10.21 (V)	PE	4742
	(2-Oxazolidinone)					
$C_3H_7NO_2^+$	$NH_2COOC_2H_5$	51-79-6	**	10.62 (V)	PE	4803
	$CH_3CH(NH_2)COOH$	56-41-7	**	8.8	PE	4221
			**	8.88	PE	4641
$C_4H_5NO_2^+$	$C_4H_5N(=O)_2$	123-56-8	**	10.01 (V)	PE	4742
	(2,5-Pyrrolidinedione)		**	10.01 (V)	PE	4810
$C_4H_7NO_2^+$	$CH_2=CHCH_2CH_2ONO$	67428-02-8	**	10.02 ± 0.02 (V)	PE	4722
			**	10.02 (V)	PE	4898
	$C_4H_4NO(=O)(CH_3)$	16112-59-7	**	9.95 (V)	PE	4742
	(2-Oxazolidinone, 4-methyl-)					
	$C_4H_4NO(=O)CH_3$	1072-70-4	**	9.99 (V)	PE	4742
	(2-Oxazolidinone, 5-methyl-)					
$C_4H_9NO_2^+$	$C_4H_5CH(NH_2)COOH$	80-60-4	**	8.70	PE	4641
	$CH_2(NH_2)COOC_2H_5$	459-73-4	**	8.8	PE	4221
$C_4H_{11}NO_2^+$	$(CH_3)_2N(O)(C_2H_4OH)$	10489-99-3	**	8.86 (V)	PE	4537
$C_5H_5NO_2^+$	$CH_2=C(CN)CO_2CH_3$	137-05-3	**	10.98 ± 0.05 (V)	PE	4859
	$CH_3CO_2C(CN)=CH_2$	3061-65-2	**	10.76 ± 0.05 (V)	PE	4859
	$C_5H_4N(O)OH$	XXXXX-XX-X	**	8.90 ± 0.05	EI	4178
	(Pyridinium, 1,2-dihydroxy-, 1-hydroxide, inner salt)					
	$C_5H_4N(O)OH$	XXXXX-XX-X	**	8.60 ± 0.05	EI	4178
	(Pyridinium, 1,3-dihydroxy-, 1-hydroxide, inner salt)					
	$C_5H_4N(O)OH$	XXXXX-XX-X	**	8.18 ± 0.05	EI	4178
	(Pyridinium, 1,4-dihydroxy-, 1-hydroxide, inner salt)					
$C_5H_7NO_2^+$	$C_5H_6NH(=O)_2$	1121-89-7	**	9.87 (V)	PE	5614
	(2,6-Piperidinedione)					
	$C_4H_4N(=O)_2(CH_3)$	1121-07-9	**	10.71 (V)	PE	5090
	(2,5-Pyrrolidinedione, 1-methyl-)					
$C_5H_9NO_2^+$	$CH_3COC(CH_3)_2NO$	6931-05-1	**	8.48 ± 0.1 (V)	PE	4465
	$C_5H_7NO(=O)(CH_3)_2$	26654-39-7	**	9.80 (V)	PE	4742
	(2-Oxazolidinone, 4,4-dimethyl-)					
	$C_5H_7NO(=O)(CH_3)_2$	58628-98-1	**	9.84 (V)	PE	4742
	(2-Oxazolidinone, 4,5-dimethyl-)					
	$C_5H_7NO(=O)(CH_3)_2$	1121-83-1	**	9.88 (V)	PE	4742
	(2-Oxazolidinone, 5,5-dimethyl-)					
$C_5H_{11}NO_2^+$	$(CH_3)_2NCH_2COOCH_3$	7148-06-3	**	7.96 ± 0.05	PE	4192
	<i>n</i> - $C_5H_7CH(NH_2)COOH$	6600-40-4	**	8.53	PE	4641
	<i>iso</i> - $C_5H_7CH(NH_2)COOH$	72-18-4	**	8.71	PE	4641

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_5H_{13}NO_2^+$	$(CH_3)_2N(O)(C_2H_5OCH_3)$	55695-37-9	**	8.37 (V)	PE	4537
$C_6H_4NO_2^+$	$C_6H_4(NO_2)_2$ (Benzene, 1,3-dinitro-)	99-65-0	NO_2	12.34 ± 0.1	EI	3447
	$C_6H_4(NO_2)_2$ (Benzene, 1,4-dinitro-)	100-25-4	NO_2	12.50 ± 0.1	EI	3447
$C_6H_5NO_2^+$	$C_6H_5NO_2$ (Benzene, nitro-)	98-95-3	**	9.85 ± 0.03	PI	5505
			**	9.87 ± 0.05	PI	5437
			**	9.88 ± 0.015 (V)	PE	4107
			**	9.92 (V)	PE	4892
			**	9.93	PE	4621
			**	9.93 (V)	PE	4884
			**	9.93 (V)	PE	5272
			**	9.94 ± 0.025	PE	3626
			**	9.99 ± 0.01	PE	3721
			**	9.99	PE	3856
			**	10.8 (V)	PE	4467
			**	9.6	EI	3916
			**	9.65 ± 0.1	EI	3447
			**	9.90	EI	3485
	C_5H_4NCOOH (3-Pyridinecarboxylic acid)	59-67-6	**	9.38	PE	5093
$C_6H_7NO_2^+$	$C_5H_4N(O)OCH_3$ (Pyridine, 4-methoxy-, 1-oxide)	1122-96-9	**	7.74 ± 0.05 (V)	PE	4275
			**	7.89 (V)	PE	4222
	$C_5H_4N(O)OCH_3$ (Pyridinium, 1-hydroxy-2-methoxy-, hydroxide, inner salt)	XXXXX-XX-X	**	8.21 ± 0.05	EI	4178
	$C_5H_4N(O)OCH_3$ (Pyridinium, 1-hydroxy-3-methoxy-, hydroxide, inner salt)	XXXXX-XX-X	**	8.40 ± 0.05	EI	4178
	$C_5H_4N(O)OCH_3$ (Pyridinium, 1-hydroxy-4-methoxy-, hydroxide, inner salt)	XXXXX-XX-X	**	7.98 ± 0.05	EI	4178
	$C_5H_4N(O)OCH_3$ (Pyridinium, 3-hydroxy-1-methoxy-, hydroxide, inner salt)	XXXXX-XX-X	**	8.3	EI	4178
	$C_5H_4N(=O)OCH_3$ (2(1H)-Pyridinone, 1-methoxy-)	40775-55-1	**	8.32 ± 0.05	EI	4178
	$C_5H_4N(=O)OCH_3$ (4(1H)-Pyridinone, 1-methoxy-)	XXXXX-XX-X	**	8.49 ± 0.05	EI	4178
	$C_4H_4NCOOCH_3$ (1H-Pyrrole-2-carboxylic acid, methyl ester)	1193-62-0	**	8.65 ± 0.05	EI	3482
$C_6H_{11}NO_2^+$	$CH_3COCH_2C(CH_3)_2NO$	60027-50-1	**	7.96 ± 0.1 (V)	PE	4465
$C_6H_{13}NO_2^+$	$n-C_4H_9CH(NH_2)COOH$	327-57-1	**	8.52	PE	4641
	$sec-C_4H_9CH(NH_2)COOH$	73-32-5	**	8.66	PE	4641
	$iso-C_4H_9CH(NH_2)COOH$	61-90-5	**	8.51	PE	4641
$C_7H_4NO_2^+$	$C_6H_5COC_6H_4NO_2$ (Methanone, (2-nitrophenyl)phenyl-)	2243-79-0		10.3 ± 0.1	EI	4358
$C_7H_6NO_2^+$	$C_6H_4(NO_2)C_4H_9$ (Benzene, 1-butyl-3-nitro-)	20651-76-7		13.08 ± 0.1	EI	3629

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₇H₆NO₂⁺	C ₆ H ₅ (NO ₂)C ₂ H ₅ (Benzene, 1-butyl-4-nitro-)	20651-75-6		12.54±0.1	EI	3629
C₇H₇NO₂⁺	C ₆ H ₅ (NO)(OCH ₃) (Benzene, 1-methoxy-4-nitroso-)	1516-21-8	**	8.46±0.1 (V)	PE	4465
	CH ₃ C ₆ H ₄ NO ₂ (Benzene, 1-methyl-2-nitro-)	88-72-2	**	9.50 (V)	PE	4892
			**	9.43±0.05	PI	5437
	C ₆ H ₅ (CH ₃)NO ₂ (Benzene, 1-methyl-3-nitro-)	99-08-1	**	9.63 (V)	PE	5272
			**	9.69±0.015 (V)	PE	4107
			**	9.50	PE	4892
			**	9.48 (V)	PE	5272
	C ₆ H ₅ (CH ₃)NO ₂ (Benzene, 1-methyl-4-nitro-)	99-99-0	**	9.49±0.015 (V)	PE	4107
			**	9.48±0.1	EI	3447
			**	9.50	PE	4892
			**	9.52 (V)	PE	5272
			**	9.54±0.015 (V)	PE	4107
			**	9.50±0.1	EI	3447
			**	9.56	EI	4089
			**	9.1±0.1	PE	4401
	C ₆ H ₅ (NH ₂)COOH (Benzoic acid, 3-amino-)	99-05-8	**	8.41±0.2	EI	3973
	C ₆ H ₅ (NH ₂)COOH (Benzoic acid, 4-amino-)	150-13-0	**	8.36±0.2	EI	3973
	C ₆ H ₅ OOCNH ₂ (Carbamic acid phenyl ester)	622-46-8	**	9.14 (V)	PE	4803
	C ₅ H ₅ NCOOCH ₃ (3-Pyridinecarboxylic acid, methyl ester)	93-60-7	**	9.25	PE	5093
			**	9.85±0.1	EI	4302
	C ₆ H ₅ (NO ₂)C ₂ H ₅ (Benzene, 1-butyl-3-nitro-)	20651-76-7	CH ₂ =CHCH ₃	11.52±0.1	EI	3629
	C ₆ H ₅ (NO ₂)C ₂ H ₅ (Benzene, 1-butyl-4-nitro-)	20651-75-6	CH ₂ =CHCH ₃	11.44±0.1	EI	3629
C₇H₉NO₂⁺	C ₅ H ₉ OCON(CH ₃) ₂ (2-Furancarboxamide, N,N-dimethyl-)	13156-75-7	**	8.86±0.05 (V)	PE	4626
C₇H₁₀NO₂⁺	C ₇ H ₁₀ NO(=O) (8-Azabicyclo[3.2.1]oct-8-yloxy, 3-oxo-)	38390-62-4	**	7.4±0.1	OTH	5379
	C ₄ H ₈ NO(COCH=CHCH ₃) (Morpholine, 4-(1-oxo-2-butenyl)-)	51944-66-2	**	11.1±0.1	EI	3996
C₇H₁₁NO₂⁺	C ₇ H ₁₁ NO ₂	61759-61-3	**	8.21 (V)	PE	4803
	C ₃ HN(=O) ₂ (C ₂ H ₅) ₂ (2,4-Azetidinedione, 3,3-diethyl-)	42282-85-9	**	9.57	EI	4660
C₇H₁₂NO₂⁺	C ₁₁ H ₂₀ N ₂ O ₄ (L-Alanine, N-(N-acetyl-L-valyl)-methyl ester)	55728-13-7		9.3±0.1	PI	5279
C₈H₅NO₂⁺	C ₆ H ₅ (CN)COOH (Benzoic acid, 4-cyano-)	619-65-8	**	10.27±0.2	EI	3973
	C ₆ H ₅ N(=O) ₂ (1H-Indole-2,3-dione)	91-56-5	**	8.98±0.05 (V)	PE	4708

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_8H_5NO_2^+$	$C_8H_5N(=O)_2$ (1H-Isindole-1,3(2H)-dione)	85-41-6	**	9.78 ± 0.05 (V)	PE	4708
			**	9.90 (V)	PE	5614
$C_8H_7NO_2^+$	$C_8H_7(OCH_3)(C \equiv NO)$ (Benzonitrile, 4-methoxy-N-oxide)	15500-73-9	**	8.42 (V)	PE	4719
$C_8H_8NO_2^+$	$C_8H_7(Cl)(OCH_3)NHCHO$ (Formamide, <i>N</i> -(2-chloro-4-methoxyphenyl)-)	53666-45-8	Cl	9.4 ± 0.1	EI	4359
	$C_8H_7(Cl)(OCH_3)NHCHO$ (Formamide, <i>N</i> -(2-chloro-5-methoxyphenyl)-)	53666-47-0	Cl	9.0 ± 0.1	EI	4359
$C_8H_9NO_2^+$	$C_8H_8(OCH_3)(CONH_2)$ (Benzamide, 3-methoxy-)	5813-86-5	**	8.60 (V)	PE	4918
	$C_8H_8(OCH_3)(CONH_2)$ (Benzamide, 4-methoxy-)	3424-93-9	**	8.62 (V)	PE	4918
	$C_8H_8(OH)CH=N(O)CH_3$	XXXXX-XX-X	**	7.76 (V)	PE	5590
	$C_8H_8(OH)NHCOCH_3$ (Acetamide, <i>N</i> -(2-hydroxyphenyl)-)	614-80-2	**	7.01 ± 0.02	EI	3631
	$C_8H_8(OH)NHCOCH_3$ (Acetamide, <i>N</i> -(4-hydroxyphenyl)-)	103-90-2	**	7.57 ± 0.02	EI	3631
	$C_8H_8(CH_3)_2NO_2$ (Benzene, 1,3-dimethyl-2-nitro-)	81-20-9	**	9.17 ± 0.015	PE	4107
	$C_8H_8(CH_3)_2NO_2$ (Benzene, 2,4-dimethyl-1-nitro-)	89-87-2	**	9.17 (V)	PE	5272
			**	9.36 (V)	PE	5272
	$C_5H_4NCH_2COOCH_3$ (2-Pyridineacetic acid methyl ester)	1658-42-0	**	9.38 ± 0.015 (V)	PE	4107
			**	9.40 ± 0.02	EI	3627
	$C_5H_4NCH_2COOCH_3$ (3-Pyridineacetic acid methyl ester)	39998-25-9	**	9.52 ± 0.02	EI	3627
	$C_5H_4NCH_2COOCH_3$ (4-Pyridineacetic acid methyl ester)	29800-89-3	**	9.62 ± 0.02	EI	3627
	$C_5H_4NCOOC_2H_5$ (4-Pyridinecarboxylic acid ethyl ester)	1570-45-2	**	9.75 ± 0.1	EI	4302
$C_8H_7D_2NO_2^+$	$C_8H_5CD_2CH_2ONO$ (Nitrous acid 2-phenylethyl-2,2- d_2 ester)	67428-03-9	**	9.13 ± 0.02 (V)	PE	4722
			**	9.13 (V)	PE	4898
$C_8H_{12}NO_2^+$	$C_8H_{12}NO(=O)$ (9-Azabicyclo[3.3.1]non-9-yloxy,3-oxo-)	7123-92-4	**	7.4 ± 0.1	OTH	5379
$C_8H_{13}NO_2^+$	$C_4H_8NO(COCH=CHCH_3)$ (Morpholine, 4-(1-oxo-2-butenyl)-)	51944-66-2	**	8.8 ± 0.1	EI	3996
$C_9H_7NO_2^+$	$C_8H_5N(=O)_2CH_3$ (1H-Isindole-1,3(2H)-dione, 2-methyl-)	550-44-7	**	9.55 ± 0.05 (V)	PE	4854
$C_9H_{11}NO_2^+$	$C_8H_8(OCH_3)CH=N(O)CH_3$	XXXXX-XX-X	**	7.60 (V)	PE	5590
	$C_5H_4N(CH_3)=CHCOOCH_3$ (Acetic acid, (1-methyl-2(1H)-pyridinylidene)-, methyl ester)	39998-21-5	**	7.02 ± 0.02	EI	3627
	$C_5H_4N(CH_3)=CHCOOCH_3$ (Acetic acid, (1-methyl-4(1H)-pyridinylidene)-, methyl ester)	39998-22-6	**	6.82 ± 0.02	EI	3627

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_9H_{11}NO_2^+$	$C_7H_8NCO_2CH_3$ (2-Azabicyclo[3.2.1]octa-3,6-diene-2-carboxylic acid methyl ester)	56125-93-0	**	8.20 (V)	PE	5481
	$C_6H_2(CH_3)_3NO_2$ (Benzene, 1,3,5-trimethyl-2-nitro-)	603-71-4	**	9.01 (V)	PE	5272
	$C_6H_5CH_2CH(NH_2)COOH$ (DL-Phenylalanine)	150-30-1	**	≤ 8.4	PI	3766
$C_9H_{13}NO_2^+$	$C_7H_{10}NCO_2CH_3$ (2-Azabicyclo[3.2.1]oct-3-ene-2-carboxylic acid methyl ester)	56125-94-1	**	8.03 (V)	PE	5481
	$C_7H_{10}NCO_2CH_3$ (2-Azabicyclo[3.2.1]oct-6-ene-2-carboxylic acid methyl ester)	56125-95-2	**	8.60 (V)	PE	5481
	$C_9H_{13}NO_2$ (1,2-Benzenediol, 4-(2-aminopropyl)-)	555-64-6	**	8.18 ± 0.06 (V)	PE	4758
	$C_5H_5N(CH_2)_3CH_2COOCH_3$ (3-Pyridineacetic acid, 1,4-dihydro-1-methyl-, methyl ester)	39998-23-7	**	6.94 ± 0.02	EI	3627
$C_9H_{14}NO_2^+$	$C_7H_8NO(=O)(CH_2)_2$ (8-Azabicyclo[3.2.1]oct-8-yloxy, 1,5-dimethyl-3-oxo-)	34061-60-4	**	7.4 ± 0.1	OTH	5379
$C_9H_{15}NO_2^+$	$C_7H_{12}NCO_2CH_3$ (2-Azabicyclo[3.2.1]octane-2-carboxylic acid methyl ester)	71017-44-2	**	8.70 (V)	PE	5481
	$C_7H_{12}NOCOCH_3$ (1-Azabicyclo[2.2.2]octane-4-ol acetate(ester))	26458-76-4	**	8.42 ± 0.015 (V)	PE	4286
	$C_3HN(=O)_2(iso-C_3H_7)_2$ (2,4-Azetidinedione, 3,3-bis(1-methylethyl)-)	17197-62-5	**	9.42	EI	4660
$C_9H_{16}NO_2^+$	$C_5H_4N(O)(=O)(CH_2)_4$ (1-Piperidinyloxy, 2,2,6,6-tetramethyl-4-oxo-)	2896-70-0	**	7.40 ± 0.05	EI	3494
			**	7.4 ± 0.1	OTH	5379
$C_9H_{17}NO_2^+$	$C_5H_4N(=O)(OH)(CH_2)_4$ (4-Piperidinone, 1-hydroxy-2,2,6,6-tetramethyl-)	3637-11-4	**	8.51 ± 0.05	EI	3494
	<i>trans</i> -(C_2H_5) ₂ NCH=CHCOO ₂ H ₅	13894-28-5	**	7.63 (V)	PE	388
$C_9H_{18}NO_2^+$	$C_5H_3NO(CH_2)_4OH$ (1-Piperidinyloxy, 4-hydroxy-2,2,6,6-tetramethyl-)	2226-96-2	**	7.4 ± 0.1	OTH	5379
$C_{10}H_7NO_2^+$	$C_{10}H_7NO_2$ (Naphthalene, 1-nitro-)	86-57-7	**	8.60 ± 0.01	PI	5505
	$C_{10}H_7NO_2$ (Naphthalene, 2-nitro-)	581-89-5	**	8.67 ± 0.01	PI	5505
$C_{10}H_{13}NO_2^+$	$C_6H_5(NO_2)C_4H_9$ (Benzene, 1-butyl-3-nitro-)	20651-76-7	**	9.94 ± 0.1	EI	3629
	$C_6H_5(NO_2)C_4H_9$ (Benzene, 1-butyl-4-nitro-)	20651-75-6	**	10.07 ± 0.1	EI	3629
	$C_6H_5O_2CH_2CH(NH_2)CH_3$ (1,3-Benzodioxole, 5-ethanamine- α -methyl-(\pm)-)	51497-09-7	**	8.01 ± 0.06 (V)	PE	4758
$C_{10}H_{15}NO_2^+$	$C_6H_5(OCH_2)_2CH_2CH_2NH_2$ (Benzeethanamine, 3,4-dimethoxy-)	120-20-7	**	8.03 ± 0.16 (V)	PE	4672

Ion	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{10}H_{17}NO_2^+$	$C_{10}H_{17}NO_2$ (8-Azabicyclo[3.2.1]octan-3-ol,8-methyl acetate(ester), <i>endo</i> -)	3423-27-6	**	8.0 ± 0.15	EI	5401
	$C_{10}H_{17}NO_2$ (8-Azabicyclo[3.2.1]octan-3-ol,8-methyl-acetate(ester), <i>exo</i> -)	3423-26-5	**	8.1 ± 0.15	EI	5401
	$C_{10}H_{17}NO_2$ (2,4-Azetidinedione, 1-methyl-3,3-bis(1-methylethyl)-)	38951-66-5	**	9.27	EI	4660
$C_{11}H_9NO_2^+$	$C_{11}H_9(NO_2)$ (1,4-Methanonaphthalene, 1,4-dihydro-5-nitro-)	58673-43-1	**	8.87 ± 0.05 (V)	PE	5019
	$C_{11}H_9(NO_2)$ (1,4-Methanonaphthalene, 1,4-dihydro-6-nitro-)	XXXXX-XX-X	**	8.96 ± 0.05 (V)	PE	5019
$C_{11}H_{11}NO_2^+$	$C_7HN(=O)_2C_2H_3(C_6H_5)$ (2,4-Azetidinedione, 3-ethyl-3-phenyl-)	42282-82-6	**	8.90	EI	4660
	$C_{11}H_{11}NO_2$ (Carbamic acid, 1,3-butadienyl-phenyl ester, (E)-)	61759-55-5	**	8.30 (V)	PE	4803
$C_{11}H_{17}NO_2^+$	$C_{11}H_{17}NO_2$ (Benzenethanamine, 2,5-dimethoxy- α -methyl-(\pm)-)	13641-74-2	**	7.70 ± 0.06 (V)	PE	4758
	$C_{11}H_{17}NO_2$ (Benzenethanamine, 2,4-dimethoxy- α -methyl-(\pm)-)	52850-81-4	**	7.91 ± 0.06 (V)	PE	4758
	$C_{11}H_{17}NO_2$ (Benzenethanamine, 3,4-dimethoxy- α -methyl-)	120-26-3	**	8.18 ± 0.06 (V)	PE	4758
				8.03 ± 0.06 (V)	PE	4758
$C_{12}H_7NO_2^+$	$C_{12}H_7N(=O)_2$ (1H-Benz[de]isoquinoline-1,3(2H)-dione)	81-83-4	**	8.68 ± 0.05 (V)	PE	5095
$C_{12}H_{11}NO_2^+$	$C_{25}H_{37}N_3O_4$ (L-Tryptophan,N-[N-(1-oxodecyl)-L-alanyl]-methyl ester)	55728-17-1		8.9 ± 0.1	PI	5279
$C_{12}H_{13}NO_2^+$	$C_{12}H_{13}NO_2$ (2,4-Azetidinedione, 3-ethyl-1-methyl-3-phenyl-)	56519-51-8	**	8.82	EI	4660
$C_{12}H_{11}NO_2^+$	$C_{27}H_{39}N_4O_8S$ (L-Cysteine,S-(2-methoxy-2-oxoethyl)-N-[N-[N-(1-oxopropyl)-L-phenylalanyl]-L-leucyl]glycyl]-methyl ester)	35146-63-5		9.1 ± 0.1	PI	5279
$C_{12}H_{19}NO_2^+$	$C_{12}H_{19}NO_2$ (Benzenethanamine, 2,5-dimethoxy- α ,4-dimethyl-(\pm)-)	26011-50-7	**	7.62 ± 0.06 (V)	PE	4758
$C_{12}H_{22}NO_2^+$	$C_{30}H_{45}N_5O_6$ (L-Alanine,N-[N-[N-(1-oxodecyl)glycyl]-L-tryptophyl]-L-alanyl]-methyl ester)	19716-78-0		9.5 ± 0.1	PI	5279
$C_{13}H_8NO_2^+$	$C_6H_5COC_6H_4NO_2$ (Methanone, (3-nitrophenyl)phenyl-)	2243-80-3		11.2 ± 0.1	EI	4358
	$C_6H_5COC_6H_4NO_2$ (Methanone, (4-nitrophenyl)phenyl-)	1144-74-7		11.5 ± 0.1	EI	4358
$C_{13}H_9NO_2^+$	$C_{13}H_9N(=O)_2$ (1H-Benz[de]isoquinoline-1,3(2H)-dione,2-methyl-)	2382-08-3	**	8.57 ± 0.05 (V)	PE	5095

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{13}H_{10}NO_2^+$	$(C_6H_4NO_2)_2CH_2$ (Benzene, 1,1'-methylenebis[4-nitro-])	1817-74-9	NO_2	11.1 ± 0.1	EI	3807
$C_{13}H_{11}NO_2^+$	$C_6H_5CH_2C_6H_4NO_2$ (Benzene, 1-nitro-4-(phenylmethyl)-)	1817-77-2	**	9.35 ± 0.05	EI	3806
$C_{13}H_{12}NO_2^+$	$C_6H_4(COC_5H_8N)_2$ (Pyridine, 1,2,3,4-phenylenedicarbonyl)bis[1,2,3,4-tetrahydro-]	52881-76-2		10.5	EI	4346
	$C_6H_4(COC_5H_8N)_2$ (Pyridine, 1,1'-(1,4-phenylenedicarbonyl)bis[1,2,3,4-tetrahydro-])	52881-77-3		11.6	EI	4346
$C_{13}H_{14}NO_2^+$	$C_5H_{10}NCOC_6H_4COC_5H_8N$ (Pyridine, 1,2,3,4-tetrahydro-1-[4-(1-piperidinylcarbonyl)benzoyl]-)	52881-78-4		11.4	EI	4346
	$C_6H_4(COC_5H_{10}N)_2$ (Piperidine, 1,1'-(1,2-phenylenedicarbonyl)bis-)	38256-33-6		11.8	EI	4346
	$C_6H_4(COC_5H_{10}N)_2$ (Piperidine, 1,1'-(1,4-phenylenedicarbonyl)bis-)	15088-30-9		12.7	EI	4346
$C_{13}H_{15}NO_2^+$	$C_3N(=O)_2(C_2H_5)_2C_6H_5$ (2,4-Azetidinedione, 3,3-diethyl-1-phenyl-)	15745-94-5	**	8.71	EI	4660
$C_{13}H_{24}NO_2^+$	$C_{25}H_{37}N_3O_4$ (L-Tryptophan, N-[N-(1-oxodecyl)-L-alanyl]-methyl ester)	55728-17-1		9.5 ± 0.1	PI	5279
	$C_{20}H_{34}N_4O_4$ (L-Histidine, N-[N-(1-oxodecyl)-L-alanyl]-methyl ester)	31944-64-6		8.8 ± 0.1	PI	5279
	$C_{17}H_{32}N_2O_5$ (L-Serine, N-[N-(1-oxodecyl)-L-alanyl]-methyl ester)	55728-15-9		9.6 ± 0.1	PI	5279
	$C_{20}H_{37}N_3O_5$ (L-Alanine, N-[N-[N-(1-oxodecyl)-L-alanyl]-L-alanyl]-methyl ester)	55728-11-5		9.5 ± 0.1	PI	5279
	$C_{24}H_{43}N_3O_5$ (L-Alanine, N-[N-[N-(1-oxodecyl)-L-alanyl]-L-leucyl]-methyl ester)	55728-12-6		9.6 ± 0.1	PI	5279
$C_{13}H_9NO_2^+$	$C_{14}H_9NO_2$ (Anthracene, 9-nitro-)	602-60-8	**	7.88 ± 0.03 (V)	PE	4887
	$C_6H_4C_4O_2NC_5H_5$ (Pyridinium, 2,3-dihydro-1,3-dioxo-1H-indene-2-ylide)	1283-93-8	**	7.6	CTS	5592
$C_{14}H_{13}NO_2^+$	$C_6H_5CH_2CH_2C_6H_4NO_2$ (Benzene, 1-nitro-4-(2-phenylethyl)-)	14310-29-3	**	9.17 ± 0.05	EI	3806
$C_{13}H_{11}NO_2^+$	$C_6H_4C_4O_2C_5H_4NCH_3$ (Pyridinium, 3-(1,3-dihydro-1,3-dioxo-2H-inden-2-yl)-1-methyl-hydroxide, inner salt)	59804-88-5	**	7.20	CTS	5592
	$C_6H_4C_4O_2C_5H_4NCH_3$ (Pyridinium, 1,3-dihydro-1,3-dioxo-2H-inden-2-ylide)	59804-81-8	**	7.35	CTS	5592
	$C_6H_4C_4O_2NC_5H_4CH_3$ (Pyridinium, 3-methyl-1,3-dihydro-1,3-dioxo-2H-inden-2-ylide)	59804-82-9	**	7.55	CTS	5592
$C_{13}H_{15}NO_2^+$	$C_6H_5CH_2OC_6H_4NHCOCH_3$ (Acetamide, N-[4-(phenylmethoxy)phenyl]-)	41927-14-4	**	7.88	CTS	5336

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{15}H_{16}\dot{N}O_2^+$	$C_6H_4(CH_2COC_5H_8N)_2$ (Pyridine, 1,1'-[1,2-phenylenebis(1-oxo-2,1-ethanediyl)]bis[1,2,3,4-tetrahydro-])	52881-80-8		10.8	EI	4346
$C_{15}H_{18}NO_2^+$	$C_6H_4(CH_2COC_5H_{10}N)_2$ (Piperidine, 1,1'-[1,2-phenylenebis(1-oxo-2,1-ethanediyl)]bis-)	52881-79-5		12.1	EI	4346
$C_{16}H_{13}NO_2^+$	$C_9H_6N(O)(C_6H_4OCH_3)$ (Isoquinolinium, 4-hydroxy-2-(4-methoxyphenyl)-hydroxide, inner salt)	56359-30-9	**	6.93 ± 0.05	EI	4863
	$C_9H_6N(=O)(C_6H_4OCH_3)$ (Indeno[1,2- <i>b</i>]azirin-6(1H)-one, 1a,6a-dihydro-1-(4-methoxyphenyl)-)	55507-32-9	**	7.68 ± 0.05	EI	4863
	$C_9H_6N_3(=O)(C_6H_4OCH_3)$ (Indeno[1,2- <i>d</i>]triazol-8(3H)-one, 3a,8a-dihydro-3-(4-methoxyphenyl)-)	55507-28-3	N_2	7.8 ± 0.1	EI	4863
$C_{18}H_{11}NO_2^+$	$C_6H_4C_3O_2NC_6H_7$ (Isoquinolinium, 1,3-dihydro-1,3-dioxo-2H-inden-2-ylide)	27609-07-0	**	7.5	CTS	5592
	$C_6H_4C_3O_2NC_6H_7$ (Quinolinium, 1,3-dihydro-1,3-dioxo-2H-inden-2-ylide)	59804-80-7	**	7.45	CTS	5592
$C_{19}H_{16}NO_2^+$	$(C_6H_4COC_5H_8N)_2$ (Pyridine, 1,1'-([1,1'-biphenyl]-2,2'-diylldicarbonyl)bis[1,2,3,4-tetrahydro-])	52882-85-6		10.9	EI	4346
	$(C_6H_4COC_5H_8N)_2$ (Pyridine, 1,1'-([1,1'-biphenyl]-4-4'-diylldicarbonyl)bis[1,2,3,4-tetrahydro-])	52882-88-9		11.1	EI	4346
$C_{19}H_{18}NO_2^+$	$C_6H_4(COC_5H_8N)C_6H_4COC_5H_{10}N$ (Pyridine, 1,2,3,4-tetrahydro-1-[[2'-(1-piperidinyldicarbonyl)[1,1'-biphenyl]-2-carbonyl]-])	52882-86-7		10.4	EI	4346
	$(C_6H_4COC_5H_{10}N)_2$ (Piperidine, 1,1'-([1,1'-biphenyl]-2,2'-diylldicarbonyl)bis-)	52882-84-5		12.0	EI	4346
	$(C_6H_4COC_5H_{10}N)_2$ (Piperidine, 1,1'-([1,1'-biphenyl]-4-4'-diylldicarbonyl)bis-)	52882-87-8		12.3	EI	4346
$C_{20}H_{15}NO_2^+$	$C_3(C_6H_5)_2O_2NC_6H_5$ (Pyridinium, 1-benzoyl-2-oxo-2-phenylethylide)	17281-65-1	**	8.14	CTS	5591
$C_{21}H_{15}NO_2^+$	$C_3N(=O)_2(C_6H_5)_3$ (2,4-Azetidinedione, 1,3,3-triphenyl-)	15745-93-4	**	8.37	EI	4660
$C_{24}H_{17}NO_2^+$	$C_3(C_6H_5)_2O_2NC_6H_7$ (Quinolinium, 1-benzoyl-2-oxo-2-phenylethylide)	XXXXX-XX-X	**	7.92	CTS	5591
$C_2H_4N_2O_2^+$	$NH_2COCONH_2$	471-46-5	**	9.41	PE	4487
			**	9.80 (V)	PE	4462
			**	9.80 (V)	PE	5517
	$NH_2CONHCHO$	1190-24-5	**	10.58 (V)	PE	4599
$C_2H_6N_2O_2^+$	$(CH_3)_2NNO_2$	4164-28-7	**	9.53	PE	4647
	<i>trans</i> -(CH_3NO) ₂	XXXXX-XX-X	**	8.68 (V)	PE	4465
$C_3H_4N_2O_2^+$	$C_2HN_2O_2CH_3$ (Sydnone, 3-methyl-)	6939-12-4	**	9.0	CTS	4348

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₃H₆N₂O₂⁺	CH ₃ CONHCONH ₂	591-07-1	**	10.3 (V)	PE	4599
C₃H₈N₂O₂⁺	(CH ₃) ₂ NCH ₂ NO ₂	53915-73-4	**	9.17 (V)	PE	4192
C₄H₄N₂O₂⁺	C ₄ H ₄ N ₂ O ₂ (Pyrazine, 1,4-dioxide)	2423-84-9	**	8.33±0.02 (V)	PE	4470
	C ₄ H ₄ N ₂ O ₂ (Pyridazine, 1,2-dioxide)	19194-87-7	**	8.51±0.02 (V)	PE	4470
	C ₄ H ₄ N ₂ (=O) ₂ (2,4(1H,3H)-Pyrimidinedione)	66-22-8	**	9.45 (V)	PE	4754
			**	9.50±0.03 (V)	PE	4445
			**	9.59 (V)	PE	5472
			**	9.60 (V)	PE	4599
			**	9.68 (V)	PE	5577
			**	9.35±0.1	EI	5555
			**	9.53±0.02	EI	3571
	C ₄ H ₄ NNO ₂ (Pyrrole, 2-nitro-)	5919-26-6	**	9.30±0.05	EI	3482
C₄H₆N₂O₂⁺	C ₂ N ₂ O(=O)(CH ₃) ₂ (1,3,4-Oxadiazol-2(5H)-one, 5,5-dimethyl-)	28873-61-2	**	10.20 (V)	PE	4929
	C ₄ H ₆ N ₂ O ₂ (2,4(1H,3H)-Pyrimidinedione, dihydro-)	504-07-4	**	10.00 (V)	PE	4599
			**	10.0±0.1	EI	5555
C₄H₈N₂O₂⁺	CH ₃ NHCOCONHCH ₃	615-35-0	**	9.33	PE	4462
C₅H₄N₂O₂⁺	C ₅ H ₄ NNO ₂ (Pyridine, 2-nitro-)	15009-91-3	**	10.1±0.1	EI	4302
	C ₅ H ₄ NNO ₂ (Pyridine, 3-nitro-)	2530-26-9	**	10.3±0.1	EI	4302
	C ₅ H ₄ NNO ₂ (Pyridine, 4-nitro-)	1122-61-8	**	10.4	PE	4536
			**	10.2±0.1	EI	4302
C₅H₆N₂O₂⁺	C ₄ H ₃ N ₂ (=O) ₂ CH ₃ (2,4(1H,3H)-Pyrimidinedione, 1-methyl-)	615-77-0	**	9.0±0.1	EI	5555
	C ₄ H ₃ N ₂ (=O) ₂ CH ₃ (2,4(1H,3H)-Pyrimidinedione, 5-methyl-)	65-71-4	**	9.02 (V)	PE	4754
			**	9.14±0.03 (V)	PE	4445
			**	9.20 (V)	PE	4599
			**	8.95±0.1	EI	5555
C₆H₆N₂O₂⁺	C ₆ H ₄ NH ₂ (NO ₂) (Benzenamine, 2-nitro-)	88-74-4	**	8.27±0.01	PI	5552
			**	8.43 (V)	PE	3856
	C ₆ H ₄ NH ₂ (NO ₂) (Benzenamine, 3-nitro-)	99-09-2	**	8.31±0.02	PI	5552
			**	8.60 (V)	PE	3856
	C ₆ H ₄ NH ₂ (NO ₂) (Benzenamine, 4-nitro-)	100-01-6	**	8.34±0.01	PI	5552
			**	8.60 (V)	PE	3856
			**	8.43	EI	4089
			**	8.62±0.1	EI	3447

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_6H_8N_2O_2^+$	$C_4H_2N_2O_2(CH_3)_2$ (2,4(1H,3H)-Pyrimidinedione, 1,3-dimethyl-)	874-14-16	**	9.00 (V)	PE	4599
			**	8.75±0.1	EI	5555
	$C_4H_2N_2(=O)_2(CH_3)_2$ (2,4(1H,3H)-Pyrimidinedione,3,5-dimethyl-)	4160-77-4	**	8.6±0.1	EI	5555
$C_6H_{10}N_2O_2^+$	$C_6H_{10}N_2(O)_2$ (2,3-Diazabicyclo[2.2.2]oct-2-ene 2,3-dioxide)	36479-80-8	**	8.04±0.03	PE	4691
$C_6H_{12}N_2O_2^+$	$(CH_3)_2NCOCON(CH_3)_2$	1608-14-6	**	9.02	PE	4462
		34493-89-5	**	8.23±0.03 (V)	PE	4691
	$C_2N_2(O)_2(CH_3)_4$ (1,2-Diazete, 3,4-dihydro-3,3,4,4-tetramethyl-1,2-dioxide)					
$C_7H_4N_2O_2^+$	$C_6H_4(NO_2)CN$ (Benzonitrile, 3-nitro-)	619-24-9	**	10.29±0.1	EI	3447
			**	10.23±0.1	EI	3447
	$C_6H_4(NO_2)CN$ (Benzonitrile, 4-nitro-)	619-72-7	**	10.23±0.1	EI	3447
			**	10.0±0.1 (V)	PE	4854
$C_7H_8N_2O_2^+$	$C_5H_4N(O)NHCOCCH_3$ (Acetamide, <i>N</i> -2-pyridinyl-, <i>N'</i> -oxide)	6994-14-5	**	8.05±0.05	EI	4117
		XXXXXX-XX-X	**	8.40±0.05	EI	4117
	$C_5H_4N(O)NHCOCCH_3$ (Acetamide, <i>N</i> -3-pyridinyl-, 1-oxide)	14906-56-0	**	7.76±0.05	EI	4117
			**	8.02 (V)	PE	3856
	$C_6H_4(NO_2)NHCH_3$ (Benzenamine, <i>N</i> -methyl-2-nitro-)	612-28-2	**	8.02 (V)	PE	3856
		100-15-2	**	8.17 (V)	PE	3856
$C_7H_{10}N_2O_2^+$	$C_4HN_2(=O)_2(CH_3)_3$ (2,4(1H,3H)-Pyrimidinedione,1,3,5-trimethyl-)	4401-71-2	**	8.25±0.1	EI	5555
$C_7H_{12}N_2O_2^+$	$C_7H_{12}NNO_2$ (1-Azabicyclo[2.2.2]octane, 4-nitro-)	51069-42-2	**	8.81±0.015 (V)	PE	4286
			**	8.04±0.03	PE	4691
	$C_7H_{12}N_2(O)_2$ (6,7-Diazabicyclo[3.2.2]non-6-ene 6,7-dioxide)	54143-30-5	**			
$C_8H_6N_2O_2^+$	$C_8H_6N_2O_2$ (1,5-Naphthyridine 1,5-dioxide)	27305-49-3	**	8.18±0.02 (V)	PE	4551
			**	9.8±0.1 (V)	PE	4889
	$C_7H_3NN(CH_3)(=O)_2$ (5H-Pyrrolo[3,4- <i>b</i>]pyridine-5,7(6H)-dione, 6-methyl-)	6789-51-1	**	9.8±0.1 (V)	PE	4889
		2423-66-7	**	7.98±0.02 (V)	PE	4551
	$C_6H_3C_2HN_2O_2$ (Sydnone, 3-phenyl-)	120-06-9		9.0	CTS	4348
$C_8H_{10}N_2O_2^+$	$C_5H_4N(O)N(CH_3)COCH_3$ (Acetamide, <i>N</i> -methyl- <i>N</i> -2-pyridinyl-, <i>N'</i> -oxide)	54818-72-3	**	7.77±0.05	EI	4117
		54818-73-4	**	8.18±0.05	EI	4117
	$C_5H_4N(O)N(CH_3)COCH_3$ (Acetamide, <i>N</i> -methyl- <i>N</i> -3-pyridinyl-, <i>N'</i> -oxide)	54818-74-5	**	7.52±0.05	EI	4117
	$C_5H_4N(O)N(CH_3)COCH_3$ (Acetamide, <i>N</i> -methyl- <i>N</i> -4-pyridinyl-, <i>N'</i> -oxide)					

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_8H_{10}N_2O_2^+$	$C_6H_4NO_2N(CH_3)_2$ (Benzenamine, N,N-dimethyl-4-nitro-)	100-23-2	**	7.6 ± 0.1	PE	4401
			**	8.0 (V)	PE	3856
	$C_6H_2NO_2(CH_3)_2NH_2$ (Benzenamine, 2,6-dimethyl-4-nitro-)	16947-63-0	**	8.33 (V)	PE	3856
	$C_6H_2NO_2(CH_3)_2NH_2$ (Benzenamine, 3,5-dimethyl-4-nitro-)	34761-82-5	**	8.23 (V)	PE	3856
	$C_6H_4N_2(=O)_2(CH_3)_2$ (2,5-Diazabicyclo[4.2.0]oct-1(6)-ene-7,8-dione,2,5-dimethyl-)	64186-72-7	**	7.68 (V)	PE	4861
$C_8H_{14}N_2O_2^+$	$C_3H_2N_2(CH_3)_3(CO_2CH_3)$ (3H-Pyrazole-3-carboxylic acid, 4,5-dihydro-3,5,5-trimethyl-methyl ester)	22497-19-4	**	8.94 (V)	PE	4429
	$(CH_3)_2C=NN(CH_3)CH=CHCOOCH_3$	63263-00-3	**	7.80 (V)	PE	5548
	$(CH_3)CH=NN(C_2H_5)CH=CHCOOCH_3$	63263-01-4	**	7.88 (V)	PE	5548
	$C_8H_{14}N_2(O)_2$	54143-31-6	**	8.03 ± 0.03	PE	4691
	(7,8-Diazabicyclo[4.2.2]dec-7-ene 7,8-dioxide)					
$C_8H_{16}N_2O_2^+$	$C_7H_7NHCOCOONHC_3H_7$	14040-77-8	**	9.12	PE	4462
	$C_4H_3N_2(O)_2(CH_3)_4$ (Pyridazine, 3,4,5,6-tetrahydro-3,3,6,6-tetramethyl-1,2-dioxide)	54143-35-0	**	7.86 ± 0.03	PE	4691
$C_8H_{18}N_2O_2^+$	<i>trans</i> -($CH_3OC(CH_3)_2N=N$)	55204-44-9	**	8.33 (V)	PE	4429
$C_9H_{12}N_2O_2^+$	$C_6H_3NO_2(CH_3)_2N(CH_3)_2$ (Benzenamine, N,N,2-trimethyl-4-nitro-)	32417-74-6	**	8.30 (V)	PE	3856
$C_9H_{15}N_2O_2^+$	$C_4HN(O)(CH_3)_4CONH_2$ (1H-Pyrrol-1-yloxy, 3-(aminocarbonyl)-2,5-dihydro-2,2,5,5-tetramethyl-)	3229-73-0	**	7.40 ± 0.05	EI	3494
$C_9H_{17}N_2O_2^+$	$C_4H_3N(O)(CH_3)_4CONH_2$ (1-Pyrrolidinylloxy, 3-(aminocarbonyl)-2,2,5,5-tetramethyl-)	4399-80-8	**	7.40 ± 0.05	EI	3494
	$C_{11}H_{20}N_2O_4$	55728-13-7		8.9 ± 0.1	PI	5279
	(L-Alanine, N-(N-acetyl-L-valyl)-methyl ester)					
$C_{10}H_8N_2O_2^+$	$C_{10}H_6NH_2(NO_2)$ (1-Naphthalenamine,2-nitro-)	607-23-8	**	7.79 ± 0.02	PI	5552
	$C_{10}H_6NH_2(NO_2)$ (1-Naphthalenamine,4-nitro-)	776-34-1	**	7.73 ± 0.02	PI	5552
$C_{10}H_{16}N_2O_2^+$	$C_7H_7NO(CH_3)_2CH_3NO$ (2-Nitroso-1,3,3-trimethyl-2-azabicyclo[2.2.2]octan-5-one)	XXXXXX-XX-X	**	8.63 (V)	PE	4576
$C_{10}H_{18}N_2O_2^+$	$(CH_3)_2C=NN(iso-C_3H_7)CH=CHCOOCH_3$	63263-02-5	**	7.70 (V)	PE	5548
	$C_{10}H_{18}N_2O_2$ (8-Azabicyclo[3.2.1]octan-3-ol,8-methyl-methylcarbamate(ester), <i>endo</i> -)	67139-52-0	**	8.2 ± 0.15	EI	5401
	$C_{10}H_{18}N_2O_2$ (8-Azabicyclo[3.2.1]octan-3-ol,8-methyl-methylcarbamate(ester), <i>exo</i> -)	67139-53-1	**	7.8 ± 0.15	EI	5401
$C_{11}H_{12}N_2O_2^+$	$C_{11}H_{12}N_2O_2$ (DL-Tryptophan)	54-12-6	**	≤ 7.5	EI	3766

Ion	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{11}H_{21}N_2O_2^+$	$C_5H_5N(O)(CH_3)_4NHCOCCH_3$ (1-Piperidinyloxy, 4-(acetyl-amino)-2,2,6,6-tetramethyl-)	14691-89-5	**	7.40 ± 0.05	EI	3494
$C_{12}H_{10}N_2O_2^+$	$(NO_2)C_6H_4C_6H_4NH_2$ ([1,1'-Biphenyl]-4-amine-4'-nitro-)	1211-40-1	**	7.46 ± 0.03	PI	5552
	$C_{10}H_4N_2(=O)_2(CH_3)_2$ (Cyclobuta[b]quinoxaline-1,2-dione, 3,8-dihydro-3,8-dimethyl-)	33527-99-0	**	7.13 (V)	PE	4861
$C_{12}H_{20}N_2O_2^+$	$C_{12}H_{20}O_2N_2$ (2-Pentanone, 4,4'-(1,2-ethanediyldinitrilo)bis-)	6310-76-5	**	7.71 (V)	PE	3822
$C_{13}H_{10}N_2O_2^+$	$C_{12}H_7N_2O(OCH_3)$ (Phenazine, 2-methoxy-10-oxide)	2876-29-1	**	7.74 (V)	PE	4590
	$C_{12}H_7N_2O(OCH_3)$ (Phenazine, 2-methoxy-5-oxide)	3224-54-2	**	7.84 (V)	PE	4590
	$NO_2C_6H_4N=CHC_6H_5$ (Benzenamine, 4-nitro-N-(phenylmethylene)-)	69173-79-1	**	8.76 (V)	PE	5486
	$C_6H_5NNC_6H_4COOH$ (Benzoic acid, 4-(phenylazo)-(E)-)	37790-20-8	**	~ 8.75 (V)	PE	5320
	$C_6H_4(NO_2)CH=CHC_5H_4N$ (Pyridine, <i>trans</i> -3-[2-(4-nitrophenyl)ethenyl]-)	5847-74-5	**	8.58 ± 0.05 (V)	PE	4377
$C_{13}H_{12}N_2O_2^+$	$C_6H_4(NO_2)CH_2C_6H_4NH_2$ (Benzenamine, 4-[(4-nitrophenyl)methyl]-)	726-17-0	**	7.87 ± 0.05	EI	3806
$C_{13}H_{25}N_2O_2^+$	$C_{20}H_{33}N_4O_4$ (L-Histidine, N-[N-(1-oxodecyl)-L-alanyl]-methyl ester)	31944-64-6		9.1 ± 0.1	PI	5279
$C_{14}H_{10}N_2O_2^+$	$(C_6H_5)_2C_2N_2O_2$ (Sydnone, 3,4-diphenyl-)	3815-83-6		7.8	CTS	4348
$C_{11}H_{12}N_2O_2^+$	$NO_2C_6H_4N=CHC_6H_4CH_3$ (Benzenamine, N-[(3-methylphenyl)methylene]-4-nitro-)	XXXXX-XX-X	**	8.58 (V)	PE	5486
	$NO_2C_6H_3(CH_3)N=CHC_6H_5$ (Benzenamine, 2-methyl-4-nitro-N-(phenylmethylene)-)	XXXXX-XX-X	**	8.66 (V)	PE	5486
$C_{14}H_{14}N_2O_2^+$	$C_6H_4(NH_2)CH_2CH_2C_6H_4NO_2$ (Benzenamine, 4-[2-(4-nitrophenyl)ethyl]-)	7357-96-2	**	7.78 ± 0.05	EI	3806
$C_{15}H_{14}N_2O_2^+$	$NO_2C_6H_2(CH_3)_2N=CHC_6H_5$ (Benzenamine, 2,6-dimethyl-4-nitro-N-(phenylmethylene)-)	XXXXX-XX-X	**	8.51 (V)	PE	5486
	$NO_2C_6H_3(CH_3)N=CHC_6H_4CH_3$ (Benzenamine, 2-methyl-4-nitro-N-[(3-methylphenyl)methylene]-)	XXXXX-XX-X	**	~ 8.49 (V)	PE	5486
$C_{15}H_{20}N_2O_2^+$	$C_{15}H_{20}N_2O_2$ (8-Azabicyclo[3.2.1]octan-3-ol, 8-methyl-phenylcarbamate(ester), <i>exo</i> -)	29364-21-4	**	8.0 ± 0.15	EI	5401
$C_{15}H_{29}N_2O_2^+$	$C_{20}H_{37}N_4O_5$ (L-Alanine, N-[N-[N-(1-oxodecyl)-L-alanyl]-L-alanyl]-methyl ester)	55728-11-5		8.9 ± 0.1	PI	5279

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{15}H_{30}N_2O_2^+$	$C_{20}H_{37}N_3O_5$ (L-Alanine,N-[N-[N-(1-oxodecyl)-L-alanyl]-L-alanyl]-methyl ester)	55728-11-5	**	8.7 ± 0.1	PI	5279
$C_{16}H_{10}N_2O_2^+$	$C_{10}H_{10}N_2O_2$ [($\Delta^{2,2}$ -Biindoline)-3,3'-dione]	12626-73-2	**	7.17	PI	3586
$C_{16}H_{12}N_2O_2^+$	$C_6H_4(NO_2)C_3H_3(CN)C_6H_5$ (Cyclopropanecarbonitrile, 1-(p-nitrophenyl)-2-phenyl-)	10432-22-1	**	9.05 ± 0.10	EI	3575
$C_{16}H_{16}N_2O_2^+$	$NO_2C_6H_4(CH_3)_2N=CHC_6H_4CH_3$ (Benzenamine,2,6-dimethyl-4-nitro-N-[(3-methylphenyl)methylene]-) $C_{10}H_{16}N_2O_2$ (Phenol, 2,2'-[1,2-ethanediylbis(nitrilomethylidyne)]bis-)	XXXXX-XX-X	**	8.43 (V)	PE	5486
$C_{17}H_{25}N_2O_2^+$	$C_{27}H_{40}N_4O_8S$ (L-Cysteine,S-(2-methoxy-2-oxoethyl)-N-[N-[N-(1-oxopropyl)-L-phenylalanyl]-L-leucyl]glycyl]-methyl ester)	35146-63-5	**	8.8 ± 0.1	PI	5279
$C_{17}H_{33}N_2O_2^+$	$C_{10}H_{16}N_2O_4$ (Glycine,N-[N-(1-oxodecyl)-L-leucyl]-methyl ester)	55728-14-8	**	9.6 ± 0.1	PI	5279
$C_{18}H_{16}N_2O_2^+$	$C_6H_4(NH_2)OC_6H_4OC_6H_4NH_2$ (Benzenamine, 4,4'-[1,4-phenylenebis(oxy)]bis-)	3491-12-1	**	6.60	PI	4328
$C_{18}H_{20}N_2O_2^+$	$C_6H_4(COC_5H_8N)_2$ (Pyridine, 1,1'-(1,2-phenylenedicarbonyl)bis[1,2,3,4-tetrahydro-]) $C_6H_4(COC_5H_8N)_2$ (Pyridine, 1,1'-(1,4-phenylenedicarbonyl)bis[1,2,3,4-tetrahydro-])	52881-76-2	**	8.7	EI	4346
$C_{18}H_{22}N_2O_2^+$	$C_5H_{10}NCOC_6H_4COC_5H_8N$ (Pyridine, 1,2,3,4-tetrahydro-1-[4-(1-piperidinylcarbonyl)benzoyl]-)	52881-78-4	**	8.7	EI	4346
$C_{18}H_{24}N_2O_2^+$	$C_6H_4(COC_5H_{10}N)_2$ (Piperidine, 1,1'-(1,2-phenylenedicarbonyl)bis-) $C_6H_4(COC_5H_{10}N)_2$ (Piperidine, 1,1'-(1,4-phenylenedicarbonyl)bis-)	38256-33-6	**	8.9	EI	4346
$C_{18}H_{35}N_2O_2^+$	$C_{21}H_{43}N_3O_5$ (L-Alanine,N-[N-[N-(1-oxodecyl)-L-alanyl]-L-leucyl]-methyl ester)	55728-12-6	**	8.5 ± 0.1	PI	5279
$C_{20}H_{24}N_2O_2^+$	$C_6H_4(CH_2COC_5H_8N)_2$ (Pyridine, 1,1'-[1,2-phenylenebis(1-oxo-2,1-ethanediyl)]bis[1,2,3,4-tetrahydro-])	52881-80-8	**	8.6	EI	4346
$C_{20}H_{28}N_2O_2^+$	$C_6H_4(CH_2COC_5H_{10}N)_2$ (Piperidine, 1,1'-[1,2-phenylenebis(1-oxo-2,1-ethanediyl)]bis-)	52881-79-5	**	8.8	EI	4346
$C_{21}H_{11}N_2O_2^+$	$C_3(C_6H_5)_2O_2NC_5H_4CN$ (Pyridinium,4-cyano-1-benzoyl-2-oxo-2-phenylethylide)	59805-16-2	**	7.94	CTS	5591

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{21}H_{26}N_2O_2^+$	$C_{21}H_{26}N_2O_2$ (Phenol, 2,2'-[1,7-heptanediylbis(nitrilomethylidyne)]bis-)	52279-42-2	**	8.26 ± 0.06	EI	4213
$C_{24}H_{24}N_2O_2^+$	$(C_6H_4COC_5H_8N)_2$ (Pyridine, 1,1'-([1,1'-biphenyl]-2,2'-diylldicarbonyl)bis[1,2,3,4-tetrahydro-]) $(C_6H_4COC_5H_8N)_2$ (Pyridine, 1,1'-([1,1'-biphenyl]-4,4'-diylldicarbonyl)bis[1,2,3,4-tetrahydro-])	52882-85-6	**	8.4	EI	4346
$C_{24}H_{26}N_2O_2^+$	$C_6H_4(COC_5H_8N)C_6H_4COC_5H_{10}N$ (Pyridine, 1,2,3,4-tetrahydro-1-[[2'-(1-piperidinylcarbonyl)[1,1'-biphenyl]-2-carbonyl]-])	52882-86-7	**	8.4	EI	4346
$C_{24}H_{28}N_2O_2^+$	$(C_6H_4COC_5H_{10}N)_2$ (Piperidine, 1,1'-([1,1'-biphenyl]-2,2'-diylldicarbonyl)bis-) $(C_6H_4COC_5H_{10}N)_2$ (Piperidine, 1,1'-([1,1'-biphenyl]-4,4'-diylldicarbonyl)bis-)	52882-84-5	**	8.5	EI	4346
$C_{24}H_{28}N_2O_2^+$	$(C_6H_4COC_5H_{10}N)_2$ (Piperidine, 1,1'-([1,1'-biphenyl]-4,4'-diylldicarbonyl)bis-)	52882-87-8	**	8.4	EI	4346
$C_{25}H_{18}N_2O_2^+$	$C_3(C_6H_5)_2O_2(NC_5H_4)_2$ (4,4'-Bipyridinium,1-benzoyl-2-oxo-2-phenylethylide)	59805-17-3	**	7.66	CTS	5591
$C_9H_{10}N_3O_2^+$	$C_6H_4(NO_2)N=CHN(CH_3)_2$ (Methanimidamide, <i>N,N</i> -dimethyl- <i>N'</i> -(3-nitrophenyl)-) $C_6H_4(NO_2)N=CHN(CH_3)_2$ (Methanimidamide, <i>N,N</i> -dimethyl- <i>N'</i> -(4-nitrophenyl)-) $C_6H_3(Cl)(NO_2)N=CHN(CH_3)_2$ (Methanimidamide, <i>N'</i> -(2-chloro-4-nitrophenyl)- <i>N,N</i> -dimethyl-) $C_6H_3(Cl)(NO_2)N=CHN(CH_3)_2$ (Methanimidamide, <i>N'</i> -(2-chloro-5-nitrophenyl)- <i>N,N</i> -dimethyl-)	2103-47-1	H	9.5 ± 0.1	EI	4359
$C_9H_{11}N_3O_2^+$	$C_6H_4(NO_2)N=CHN(CH_3)_2$ (Methanimidamide, <i>N,N</i> -dimethyl- <i>N'</i> -(3-nitrophenyl)-) $C_6H_3(NO_2)N=CHN(CH_3)_2$ (Methanimidamide, <i>N,N</i> -dimethyl- <i>N'</i> -(4-nitrophenyl)-)	2103-47-1	**	7.8 ± 0.1	EI	4359
$C_{12}H_9N_3O_2^+$	$C_6H_3(NO_2)N=CHN(CH_3)_2$ (Methanimidamide, <i>N,N</i> -dimethyl- <i>N'</i> -(4-nitrophenyl)-)	1205-59-0	**	7.9 ± 0.1	EI	4359
$C_{12}H_9N_3O_2^+$	$C_6H_5NNC_6H_4NO_2$ (Diazene,(nitrophenyl)phenyl-(E)-)	37790-23-1	**	9.05 ± 0.05 (V)	PE	5320
$C_{15}H_{15}N_3O_2^+$	$C_{11}H_3N_3(=O)_2(CH_3)_4$ (Benzo[<i>g</i>]pyrido[2,3- <i>d</i>]pyrimidin-2,4-dione, 3,7,8,10-tetramethyl-)	XXXXXX-XX-X	**	7.94 (V)	PE	4992
$C_{18}H_{17}N_3O_2^+$	$C_6H_4(NO_2)C_3H_3(CN)C_6H_4N(CH_3)_2$ (Cyclopropanecarbonitrile, 2-(<i>p</i> -(dimethylamino)phenyl)-1-(<i>p</i> -nitrophenyl)-)	28752-34-3	**	8.30 ± 0.07	EI	3575
$C_{20}H_{25}N_3O_2^+$	$C_{20}H_{25}N_3O_2$ (Phenol, 2,2'-[iminobis(3,1-propanediyl)nitrilomethylidyne)]bis-)	52279-45-5	**	8.31 ± 0.07	EI	4213
$C_{22}H_{32}N_3O_2^+$	$C_{30}H_{35}N_5O_6$ (L-Alanine, N-[N-[N-(1-oxodecyl)glycyl]-L-tryptophyl]-L-alanyl]-methyl ester)	19716-78-0		9.6 ± 0.1	PI	5279
$C_5H_4N_4O_2^+$	$C_5H_4N_4(=O)_2$ (1H-Purine-2,6-dione,3,7-dihydro-)	69-89-6	**	8.55	PE	5093
$C_5H_4N_4O_2^+$			**	8.89 ± 0.03 (V)	PE	4445

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_6H_1N_1O_2^+$	$C_6H_1N_1(=O)_2$ (2,4-(1H,3H)-Pteridinedione)	487-21-8	**	9.20 (V)	PE	5577
$C_8H_{10}N_1O_2^+$	$C_7HN_1(=O)_2(CH_3)_3$ (1H-Purine-2,6-dione,3,7-dihydro-1,3,7-trimethyl-)	58-08-2	**	7.95	PE	5093
$C_{12}H_{10}N_1O_2^+$	$C_{10}H_1N_1(=O)_2(CH_3)_2$ (Benzo[g]pteridine-2,4(1H,3H)-dione, 1,3-dimethyl-)	2962-90-5	**	8.63 (V)	PE	4992
	$C_{10}H_1N_1(=O)_2(CH_3)_2$ (Benzo[g]pteridine-2,4(3H,10H)-dione, 3,10-dimethyl-)	4074-59-3	**	8.47 (V)	PE	4992
$C_{13}H_{11}N_1O_2^+$	$C_6H_2(CH_3)_2C_4N_1(CH_3)(=O)_2$ (Methyl-isoalloxazine)	XXXXX-XX-X	**	8.72 (V)	PE	5577
$C_{13}H_{12}N_1O_2^+$	$C_{10}H_1N_1(=O)_2(CH_3)_3$ (Benzo[g]pteridine-2,4(3H,10H)-dione, 3,6,10-trimethyl-)	XXXXX-XX-X	**	8.16 (V)	PE	4992
	$C_{10}H_1N_1(=O)_2(CH_3)_3$ (Benzo[g]pteridine-2,4(3H,10H)-dione, 3,9,10-trimethyl-)	XXXXX-XX-X	**	8.30 (V)	PE	4992
$C_{14}H_{14}N_1O_2^+$	$C_{10}H_2N_1(=O)_2(CH_3)_3$ (Benzo[g]pteridine-2,4(3H,10H)-dione, 3,7,8,10-tetramethyl-)	18636-32-3	**	8.22 (V)	PE	4992
$C_{15}H_{18}N_1O_2^+$	$C_{10}H_3N_1(=O)_2(CH_3)_5$ (Benzo[g]pteridine-2,4(1H,3H)-dione,5,10-dihydro-1,3,7,8,10-pentamethyl-)	14453-97-5	**	7.00 (V)	PE	4992
$C_2H_3NO_3^+$	$NH_2COCOOH$	471-47-6	**	10.51 (V)	PE	4487
$C_4H_3NO_3^+$	$C_3H_3ONO_2$ (Furan, 2-nitro-)	609-39-2	**	9.75 ± 0.05 (V)	PE	4626
			**	10.04 ± 0.05	EI	3482
$C_4H_7NO_3^+$	$C_2H_5O(CO)_2NH_2$	XXXXX-XX-X	**	9.85 (V)	PE	5549
$C_5H_7NO_3^+$	$CH_3CONHC(=CH_2)COOH$	XXXXX-XX-X	**	9.24 (V)	PE	4983
$C_3H_9NO_3^+$	$CH_3COOC(CH_3)_2NO$	17746-46-2	**	8.28 ± 0.1 (V)	PE	4465
$C_6H_5NO_3^+$	$C_6H_3(OH)(NO_2)$ (Phenol, 2-nitro-)	88-75-5	**	9.29 (V)	PE	4473
	$C_6H_3(OH)(NO_2)$ (Phenol, 3-nitro-)	554-84-7	**	9.33 (V)	PE	4473
	$C_6H_3(OH)(NO_2)$ (Phenol, 4-nitro-)	100-02-7	**	9.38 (V)	PE	4473
	$C_6H_4(NO_2)OOCCH_3$ (Acetic acid, 3-nitrophenyl ester)	1523-06-4	**	8.84 ± 0.1	EI	3447
	$C_6H_3(NO_2)OOCCH_3$ (Acetic acid, 4-nitrophenyl ester)	830-03-5	$CH_2=C=O$	10.85 ± 0.2	EI	3484
			$CH_2=C=O$	10.76 ± 0.2	EI	3484

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_6H_{11}NO_3^+$	$C_2H_5O(CO)_2N(CH_3)_2$	XXXXX-XX-X **		9.31 (V)	PE	5549
$C_6H_{13}NO_3^+$	$N(CH_2CH_2OH)_3$	102-71-6	**	~8.7 (V)	PE	4413
$C_7H_3NO_3^+$	$C_7H_3NO(=O)_2$ (Furo[3,4,-b]pyridine-5,7-dione)	699-98-9	**	10.5 ± 0.1 (V)	PE	4889
$C_7H_4NO_3^+$	$C_6H_5COC_6H_4NO_2$ (Methanone, (2-nitrophenyl)phenyl-)	2243-79-0		12.0 ± 0.2	EI	4335
	$C_6H_5COC_6H_4NO_2$ (Methanone, (3-nitrophenyl)phenyl-)	2243-80-3		12.0 ± 0.2	EI	4358
	$C_6H_5COC_6H_4NO_2$ (Methanone, (3-nitrophenyl)phenyl-)	2243-80-3		12.3 ± 0.2	EI	4335
	$C_6H_5COC_6H_4NO_2$ (Methanone, (4-nitrophenyl)phenyl-)	1144-74-7		12.3 ± 0.2	EI	4358
	$C_6H_4(NO_2)COOH$ (Benzoic acid, 3-nitro-)	121-92-6	OH	12.35 ± 0.2	EI	4335
	$C_6H_4(NO_2)COOH$ (Benzoic acid, 3-nitro-)	121-92-6	OH	12.35 ± 0.2	EI	4358
	$C_6H_4(NO_2)COOH$ (Benzoic acid, 4-nitro-)	62-23-7	OH	13.00 ± 0.2	EI	3973
	$C_6H_4(NO_2)COOH$ (Benzoic acid, 4-nitro-)	62-23-7	OH	11.58 ± 0.2	EI	3973
$C_7H_7NO_3^+$	$C_6H_4(NO_2)(OCH_3)$ (Benzene, 1-methoxy-2-nitro-)	91-23-6	**	9.04 (V)	PE	4473
	$C_6H_4(NO_2)(OCH_3)$ (Benzene, 1-methoxy-3-nitro-)	555-03-3	**	9.01 (V)	PE	4473
	$C_6H_4(NO_2)(OCH_3)$ (Benzene, 1-methoxy-4-nitro-)	100-17-4	**	9.09 ± 0.1	EI	3447
	$C_6H_4(NO_2)(OCH_3)$ (Benzene, 1-methoxy-4-nitro-)	100-17-4	**	8.6 ± 0.1	PE	4401
			**	8.79	PE	4621
			**	9.04 ± 0.1	EI	3447
			**	9.07 (V)	PE	4473
			**	9.08 ± 0.01 (V)	PE	4389
$C_8H_7NO_3^+$	$C_6H_4NO_2(COCH_3)$ (Ethanone, 1-(4-nitrophenyl)-)	100-19-6	**	10.15 ± 0.1 (V)	PE	4401
$C_9H_{11}NO_3^+$	$C_6H_4(OH)CH_2CH(NH_2)COOH$ (DL-Tyrosine)	556-03-6	**	<8.4	EI	3766
$C_{11}H_{17}NO_3^+$	$C_6H_2(OCH_3)_3CH_2CH_2NH_2$ (Benzeethanamine, 3,4,5-trimethoxy-)	54-04-6	**	8.18 ± 0.24 (V)	PE	4672
$C_{12}H_{19}NO_3^+$	$C_{12}H_{19}NO_3$ (Benzeethanamine, 3,4,5-trimethoxy-N-methyl-)	4838-96-4		8.44 ± 0.40 (V)	PE	4672
	$C_{12}H_{19}NO_3$ (Benzeethanamine, 2,3,4-trimethoxy- α -methyl-(\pm)-)	22199-12-8	**	8.09 ± 0.06 (V)	PE	4758
	$C_{12}H_{19}NO_3$ (Benzeethanamine, 2,4,5-trimethoxy- α -methyl-(\pm)-)	22199-15-1	**	7.66 ± 0.06 (V)	PE	4758
	$C_{12}H_{19}NO_3$ (Benzeethanamine, 2,4,6-trimethoxy- α -methyl-(\pm)-)	22199-16-2	**	7.76 ± 0.06 (V)	PE	4758
	$C_{12}H_{19}NO_3$ (Benzeethanamine, 3,4,5-trimethoxy- α -methyl-(\pm)-)	22199-17-3	**	8.16 ± 0.06 (V)	PE	4758

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{13}H_9NO_3^+$	$C_6H_5COC_6H_4NO_2$ (Methanone, (2-nitrophenyl)phenyl-)	2243-79-0	**	9.6 ± 0.1	EI	4358
	$C_6H_5COC_6H_4NO_2$ (Methanone, (3-nitrophenyl)phenyl-)	2243-80-3	**	9.6 ± 0.1 9.8 ± 0.1	EI EI	4335 4335
	$C_6H_5COC_6H_4NO_2$ (Methanone, (4-nitrophenyl)phenyl-)	1144-74-7	**	9.8 ± 0.1	EI	4358
	$C_6H_5COC_6H_4NO_2$ (Methanone, (4-nitrophenyl)phenyl-)		**	9.95 ± 0.1	EI	4335
			**	9.95 ± 0.1	EI	4358
$C_{15}H_{28}NO_3^+$	$C_{20}H_{36}N_2O_6$ (L-Alanine, N-[N-(1-oxodecyl)-L- α -glutamyl]-dimethyl ester)	55728-16-0		9.6 ± 0.1	PI	5279
	$C_{20}H_{36}N_2O_6$ (L-Alanine, N-[N-(1-oxodecyl)-L- α -glutamyl]-dimethyl ester)	55728-16-0		9.4 ± 0.1	PI	5279
$C_{17}H_{19}NO_3^+$	$C_{16}H_{14}NO(OH_2)CH_3$ (Morphinan-3,6-diol, 7,8-didehydro-4,5-epoxy-17-methyl-(5 α ,6 α)-)	57-27-2	**	8.3 (V)	PE	4646
	$C_{16}H_{14}NO(OH_2)CH_2CH=CH_2$ (Morphinan-3,6-diol, 7,8-didehydro-4,5-epoxy-17-(2-propenyl)-(5 α ,6 α)-)	62-67-9	**	8.15 (V)	PE	4646
$C_{20}H_{13}NO_3^+$	$C_6H_5OC_6H_3C_3O_2NC_3H_5$	XXXXXX-XX-X	**	7.55	CTS	5592
	$C_3H_2N_2O_3$ (Imidazolidinetrione)	120-89-8	**	10.67	PE	4471
$C_3H_6N_2O_3^+$	$C(CH_3)_2(NO_2)NO$	5275-46-7	**	9.92 ± 0.1 (V)	PE	4465
	$C_3HN_2O_3(CH_3)$ (Imidazolidinetrione, methyl-)	3659-97-0	**	10.52	PE	4471
$C_4H_4N_2O_3^+$	$C_4H_4N_2(=O)_3$ (2,4,6(1H,3H,5H)-Pyrimidinetrione)	67-52-7	**	10.20	PE	5093
	$C_5H_4N(O)NO_2$ (Pyridine, 4-nitro-, 1-oxide)	1124-33-0	**	9.03 ± 0.02 (V)	PE	4275
$C_5H_6N_2O_3^+$	$C_3N_2O_3(CH_3)_2$ (Imidazolidinetrione, dimethyl-)	5176-82-9	**	10.19	PE	4471
	$C_6H_{10}(NO)(NO_2)$ (Cyclohexane, 1-nitro-1-nitroso-)	14296-14-1	**	9.55 (V)	PE	4465
$C_7H_4N_2O_3^+$	$C_6H_4(NO_2)(C \equiv NO)$ (Benzonitrile, 4-nitro-N-oxide)	2574-03-0	**	~ 9.5 (V)	PE	4719
	$C_6H_3(Cl)(NO_2)NHCHO$ (Formamide, N-(2-chloro-4-nitrophenyl)-)	16135-32-3	Cl	10.2 ± 0.1	EI	4359

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_7H_5N_2O_3^+$	$C_6H_4(Cl)(NO_2)NHCHO$ (Formamide, <i>N</i> -(2-chloro-5-nitrophenyl)-)	53666-48-1	Cl	9.9 ± 0.1	EI	4359
$C_7H_6N_2O_3^+$	$C_6H_4(NO_2)(CONH_2)$ (Benzamide, 3-nitro-)	645-09-0	**	10.28 (V)	PE	4918
	$C_6H_4(NO_2)(CONH_2)$ (Benzamide, 4-nitro-)	619-80-7	**	10.33 (V)	PE	4918
$C_8H_8N_2O_3^+$	$C_6H_4(NO_2)NHC(=O)CH_3$ (Acetamide, <i>N</i> -(2-nitrophenyl)-)	552-32-9	**	8.85	EI	4834
$C_9H_7N_2O_3^+$	$C_6H_4(NO_2)NHC(=O)CH=CHCH_3$ (2-Butenamide, <i>N</i> -(4-nitrophenyl)-)	51944-68-4	CH_3	13.6 ± 0.3	EI	3996
$C_9H_{14}N_2O_3^+$	$C_3N_2O_4(C_3H_7)_2$ (Imidazolidinetrione, dipropyl-)	21036-96-4	**	9.90	PE	4471
$C_{10}H_{10}N_2O_3^+$	$C_6H_4(NO_2)NHC(=O)CH=CHCH_3$ (2-Butenamide, <i>N</i> -(4-nitrophenyl)-)	51944-68-4	**	9.1 ± 0.1	EI	3996
$C_{12}H_8N_2O_3^+$	$C_6H_4(NO_2)C(=O)C_5H_4N$ (Methanone, (2-nitrophenyl)-2-pyridinyl-)	27693-37-4	**	9.71	EI	5459
$C_{14}H_{14}N_2O_3^+$	$C_{14}H_{14}N_2O_3$	XXXXX-XX-X	**	8.00 (V)	PE	5590
$C_{15}H_{10}N_2O_3^+$	$C_6H_6N(O)(C_6H_4NO_2)$ (Isoquinolinium, 4-hydroxy-2-(4-nitrophenyl)-hydroxide, inner salt)	56359-31-0	**	7.29 ± 0.05	EI	4863
	$C_9H_6N(=O)(C_6H_4NO_2)$ (Indeno[1,2- <i>b</i>]azirin-6(1H)-one, 1a,6a-dihydro-1-(4-nitrophenyl)-)	55507-33-0	**	8.71 ± 0.05	EI	4863
	$C_9H_6N_3(=O)(C_6H_4NO_2)$ (Indeno[1,2- <i>d</i>]triazol-8(3H)-one, 3a,8a-dihydro-3-(4-nitrophenyl)-)	55507-29-4	N_2	8.8 ± 0.1	EI	4863
$C_{15}H_{24}N_2O_3^+$	$C_{15}H_{24}(NO)(NO_2)$ (Bicyclo[7.2.0]undecane, 6,10,10-trimethyl-2-methylene-5-nitro-6-nitroso-)	28834-17-5	**	9.26 (V)	PE	4465
$C_{16}H_{29}N_2O_3^+$	$C_{20}H_{37}N_3O_3$ (L-Alanine, N-[N-[N-(1-oxodecyl)-L-alanyl]-L-alanyl]-methyl ester)	55728-11-5		9.8 ± 0.1	PI	5279
$C_{18}H_{25}N_2O_3^+$	$C_{27}H_{40}N_4O_3S$ (L-Cysteine, S-(2-methoxy-2-oxoethyl)-N-[N-[N-(1-oxopropyl)-L-phenylalanyl]-L-leucyl]glycyl]-methyl ester)	35146-63-5		9.1 ± 0.1	PI	5279
$C_{19}H_{35}N_2O_3^+$	$C_{23}H_{43}N_3O_3$ (L-Alanine, N-[N-[N-(1-oxodecyl)-L-alanyl]-L-leucyl]-methyl ester)	55728-12-6		8.8 ± 0.1	PI	5279
$C_{20}H_{21}N_2O_3^+$	$C_{20}H_{21}N_2O_3$ (Phenol, 2,2'-[oxybis(3,1-propanediyl)nitriolomethylidyne]bis-)	52279-43-3	**	8.40 ± 0.10	EI	4213

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_8H_5N_3O_3^+$	$O_2NC_6H_4C(=O)CHN_2$ (Ethanone,2-diazo-(4-nitrophenyl)-)	4203-31-0	**	9.41 ± 0.05 (V)	PE	5326
$C_{12}H_7N_3O_3^+$	$C_{12}H_7N_2ONO_2$ (Phenazine, 2-nitro-10-oxide)	2876-33-7	**	8.46 (V)	PE	4590
$C_{18}H_{34}N_3O_3^+$	$C_{20}H_{37}N_4O_5$ (L-Alanine,N-[N-[N-(1-oxodecyl)-L-alanyl]-L-alanyl]-methyl ester)	55728-11-5		8.8 ± 0.1	PI	5279
$C_{19}H_{28}N_3O_3^+$	$C_{27}H_{40}N_4O_6S$ (L-Cysteine,S-(2-methoxy-2-oxoethyl)-N-[N-[N-(1-oxopropyl)-L-phenylalanyl]-L-leucyl]glycyl]-methyl ester)	35146-63-5		9.0 ± 0.1	PI	5279
$C_{23}H_{32}N_3O_3^+$	$C_{30}H_{43}N_5O_6$ (L-Alanine,N-[N-[N-(1-oxodecyl)glycyl]-L-tryptophyl]-L-alanyl]-methyl ester)	19716-78-0		9.5 ± 0.1	PI	5279
$C_5H_4N_4O_3^+$	$C_5H_4N_4(=O)_3$ (1H-Purine-2,6,8(3H)-trione,7,9-dihydro-)	69-93-2	**	8.15	PE	5093
$C_{25}H_{37}N_4O_3^+$	$C_{30}H_{43}N_5O_6$ (L-Alanine,N-[N-[N-(1-oxodecyl)glycyl]-L-tryptophyl]-L-alanyl]-methyl ester)	19716-78-0		9.5 ± 0.1	PI	5279
$C_7H_5NO_4^+$	$C_6H_4(NO_2)COOH$ (Benzoic acid, 3-nitro-)	121-92-6	**	10.31 ± 0.2	EI	3973
	$C_6H_4(NO_2)COOH$ (Benzoic acid, 4-nitro-)	62-23-7	**	10.18 ± 0.2	EI	3973
$C_8H_7NO_4^+$	$C_6H_4(NO_2)OOCCH_3$ (Acetic acid, 3-nitrophenyl ester)	1523-06-4	**	9.43 ± 0.2	EI	3484
	$C_6H_4(NO_2)OOCCH_3$ (Acetic acid, 4-nitrophenyl ester)	830-03-5	**	9.48 ± 0.2	EI	3484
$C_{10}H_{11}NO_4^+$	$C_6H_2(OCH_3)_3(C \equiv NO)$ (Benzonitrile, 2,4,6-trimethoxy-N-oxide)	2904-59-8	**	7.95 (V)	PE	4719
	$C_3(OCH_3)_2O_2NC_5H_5$ (Pyridinium,2-methoxy-1-(methoxycarbonyl)-2-oxoethylide)	1291-37-8	**	7.83	CTS	5591
$C_{13}H_9NO_4^+$	$C_6H_5COOC_6H_4NO_2$ (Benzoic acid, 4-nitrophenyl ester)	959-22-8	**	9.3	EI	5631
$C_{14}H_{13}NO_4^+$	$C_3(OCH_3)_2O_2NC_6H_7$ (Isoquinolium, 2-methoxy-1-(methoxycarbonyl)-2-oxoethylide)	17870-65-4	**	7.67	CTS	5591
	$C_3(OCH_3)_2O_2NC_6H_7$ (Quinolinium,1-(2-methoxy-1-(methoxycarbonyl)-2-oxoethyl)-hydroxide, inner salt)	17870-64-3	**	7.67	CTS	5591
$C_{16}H_{28}NO_4^+$	$C_{20}H_{36}N_2O_6$ (L-Alanine,N-[N-(1-oxodecyl)-L- α -glutamyl]-dimethyl ester)	55728-16-0		9.7 ± 0.1	PI	5279

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₁₇H₉NO⁺	C ₁₇ H ₉ NO ₄ (Naphtho[2,3- <i>f</i>]quinoline-7,12-dione, 5,6-dihydroxy-)	568-02-5	**	7.35	PI	3586
C₆H₄N₂O⁺	C ₆ H ₄ (NO ₂) ₂ (Benzene, 1,2-dinitro-)	528-29-0	**	10.71 (V)	PE	4892
	C ₆ H ₄ (NO ₂) ₂ (Benzene, 1,3-dinitro-)	99-65-0	**	10.43 ± 0.02	PI	5505
			**	10.40 (V)	PE	4892
			**	10.62 ± 0.1	EI	3447
	C ₆ H ₄ (NO ₂) ₂ (Benzene, 1,4-dinitro-)	100-25-4	**	10.50 ± 0.02	PI	5552
			**	10.3 ± 0.1	PE	4401
			**	10.65 (V)	PE	4892
			**	10.63 ± 0.1	EI	3447
C₁₀H₁₈N₂O⁺	<i>trans</i> -(CH ₃ C=OOC(CH ₃) ₂) ₂ N=N	55204-45-0	**	8.74 (V)	PE	4429
C₁₁H₂₀N₂O⁺	C ₁₁ H ₂₀ N ₂ O ₄ (L-Alanine, N-(N-acetyl-L-valyl)-methyl ester)	55728-13-7	**	8.6 ± 0.1	PI	5279
C₁₃H₁₀N₂O⁺	(C ₆ H ₄ (NO ₂) ₂)CH ₂ (Benzene, 1,1'-methylenebis[4-nitro-])	1817-74-9	**	9.98 ± 0.05	EI	3806
C₁₃H₁₄N₂O⁺	C ₅ H ₅ NH(=O) ₂ NC ₈ H ₈ (=O) ₂ (1H-Isoindole-1,3(2H)-dione, 2-(2,6-dioxo-3-piperidiny)-4,5,6,7-tetrahydro-)	60242-08-2	**	9.50 (V)	PE	5614
C₁₄H₁₂N₂O⁺	C ₆ H ₄ (NO ₂)CH ₂ CH ₂ C ₆ H ₄ NO ₂ (Benzene, 1,1'-(1,2-ethanediyl)bis[4-nitro-])	736-30-1	**	9.77 ± 0.05	EI	3806
C₁₅H₁₄N₂O⁺	C ₃ (OCH ₃) ₂ O ₂ (NC ₅ H ₄) ₂ (4,4'-Bipyridinium, 2-methoxy-1-(methoxycarbonyl)-2-oxoethylidene)	59805-15-1	**	7.50	CTS	5591
C₁₆H₂₉N₂O⁺	C ₂₀ H ₃₄ N ₄ O ₄ (L-Histidine, N-[N-(1-oxodecyl)-L-alanyl]-methyl ester)	31944-64-6		9.6 ± 0.1	PI	5279
C₁₈H₃₀N₂O⁺	C ₄ (N(C ₂ H ₅) ₂) ₂ (COOC ₂ H ₅) ₂ (1,3-Cyclobutadiene-1,3-dicarboxylic acid, 2,4-bis(diethylamino)-, diethyl ester)	20913-35-3	**	7.55 (V)	PE	3885
C₁₉H₃₆N₂O⁺	C ₁₉ H ₃₆ N ₂ O ₄ (Glycine, N-[N-(1-oxodecyl)-L-leucyl]-methyl ester)	55728-14-8	**	8.9 ± 0.1	PI	5279
C₆H₅N₃O⁺	C ₆ H ₅ NH ₂ (NO ₂) ₂ (Benzenamine, 2,5-dinitro-)	619-18-1	**	8.89 ± 0.01	PI	5552
C₁₆H₁₁N₃O⁺	C ₃ H ₃ (CN)((C ₆ H ₄)NO ₂) ₂ (Cyclopropanecarbonitrile, 1,2-bis(<i>p</i> -nitrophenyl)-)	28752-28-5	**	9.30 ± 0.05	EI	3575

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$\text{C}_{20}\text{H}_{28}\text{N}_3\text{O}_1^+$	$\text{C}_{27}\text{H}_{40}\text{N}_4\text{O}_8\text{S}$ (L-Cysteine,S-(2-methoxy-2-oxoethyl)-N-[N-[N-(1-oxopropyl)-L-phenylalanyl]-L-leucyl]glycyl]-methyl ester)	35146-63-5	**	9.2 ± 0.1	PI	5279
$\text{C}_{25}\text{H}_{37}\text{N}_3\text{O}_1^+$	$\text{C}_{25}\text{H}_{37}\text{N}_3\text{O}_1$ (L-Tryptophan,N-[N-(1-oxodecyl)-L-alanyl]-methyl ester)	55728-17-1	**	7.5 ± 0.1	PI	5279
$\text{C}_{20}\text{H}_{31}\text{N}_1\text{O}_1^+$	$\text{C}_{20}\text{H}_{31}\text{N}_1\text{O}_1$ (L-Histidine,N-[N-(1-oxodecyl)-L-alanyl]-methyl ester)	31944-64-6	**	8.7 ± 0.1	PI	5279
$\text{C}_{26}\text{H}_{37}\text{N}_4\text{O}_1^+$	$\text{C}_{30}\text{H}_{45}\text{N}_5\text{O}_6$ (L-Alanine,N-[N-[N-(1-oxodecyl)glycyl]-L-tryptophyl]-L-alanyl]-methyl ester)	19716-78-0	**	9.5 ± 0.1	PI	5279
$\text{C}_6\text{H}_4\text{N}_2\text{O}_5^+$	$\text{C}_6\text{H}_3(\text{NO}_2)_2\text{OH}$ (Phenol, 2,4-dinitro-)	51-28-5	**	9.57	PE	5093
$\text{C}_7\text{H}_6\text{N}_2\text{O}_5^+$	$\text{C}_6\text{H}_5(\text{NO}_2)_2\text{OCH}_3$ (Benzene,1-methoxy-2,4-dinitro-)	119-27-7	**	9.30	PE	5093
$\text{C}_{17}\text{H}_{32}\text{N}_2\text{O}_5^+$	$\text{C}_{17}\text{H}_{32}\text{N}_2\text{O}_5$ (L-Serine,N-[N-(1-oxodecyl)-L-alanyl]-methyl ester)	55728-15-9	**	9.1 ± 0.1	PI	5279
$\text{C}_{20}\text{H}_{37}\text{N}_3\text{O}_5^+$	$\text{C}_{20}\text{H}_{37}\text{N}_3\text{O}_5$ (L-Alanine,N-[N-[N-(1-oxodecyl)-L-alanyl]-L-alanyl]-methyl ester)	55728-11-5	**	8.6 ± 0.1	PI	5279
$\text{C}_{23}\text{H}_{43}\text{N}_3\text{O}_5^+$	$\text{C}_{23}\text{H}_{43}\text{N}_3\text{O}_5$ (L-Alanine,N-[N-[N-(1-oxodecyl)-L-alanyl]-L-leucyl]-methyl ester)	55728-12-6	**	8.4 ± 0.1	PI	5279
$\text{C}_{20}\text{H}_{36}\text{N}_2\text{O}_6^+$	$\text{C}_{20}\text{H}_{36}\text{N}_2\text{O}_6$ (L-Alanine,N-[N-(1-oxodecyl)-L- α -glutamyl]-dimethyl ester)	55728-16-0	**	9.1 ± 0.1	PI	5279
$\text{C}_6\text{H}_3\text{N}_3\text{O}_6^+$	$\text{C}_6\text{H}_3(\text{NO}_2)_3$ (Benzene,1,3,5-trinitro-)	99-35-4	**	10.96 ± 0.02	PI	5505
$\text{C}_7\text{H}_5\text{N}_3\text{O}_6^+$	$\text{C}_6\text{H}_2(\text{NO}_2)_3\text{CH}_3$ (Benzene,2-methyl-1,3,5-trinitro-)	118-96-7	**	10.59 ± 0.04	PI	5552
$\text{C}_{30}\text{H}_{45}\text{N}_5\text{O}_6^+$	$\text{C}_{30}\text{H}_{45}\text{N}_5\text{O}_6$ (L-Alanine,N-[N-[N-(1-oxodecyl)glycyl]-L-tryptophyl]-L-alanyl]-methyl ester)	19716-78-0	**	7.7 ± 0.1	PI	5279
$\text{BC}_6\text{H}_{10}\text{NO}^+$	$\text{C}_5\text{H}_4\text{N}(\text{OCH}_3)_2\text{BH}_3$ (Pyridine, 4-methoxy-, compound with borane(1:1))	56898-50-1	**	9.30 (V)	PE	4536
$\text{B}_2\text{C}_4\text{H}_{12}\text{N}_2\text{O}^+$	$\text{N}_2\text{B}_2\text{O}(\text{CH}_3)_4$ (1,2,4,3,5-Oxadiazadiborolidine, 2,3,4,5-tetramethyl-)	57877-89-1	**	8.39 (V)	PE	4526
	$\text{N}_2\text{B}_2\text{O}(\text{CH}_3)_4$ (1,3,4,2,5-Oxadiazadiborolidine, 2,3,4,5-tetramethyl-)	40392-38-9	**	7.88 (V)	PE	4526

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$\text{BC}_5\text{H}_7\text{N}_2\text{O}_2^+$	$\text{C}_5\text{H}_7\text{N}(\text{NO}_2)\cdot\text{BH}_3$ (Pyridine, 4-nitro-, compound with borane (1:1))	56898-55-6	**	10.27 (V)	PE	4536
$\text{B}_2\text{C}_5\text{H}_{13}\text{N}_3\text{O}_2^+$	$\text{N}_3\text{B}_2(\text{CH}_3)_2(\text{OCH}_3)_2$ (1,2,4,3,5-Triazadiborolidine, 3,5-dimethoxy-1,2,4-trimethyl-)	53161-86-7	**	7.54 (V)	PE	4526
$\text{B}_2\text{C}_6\text{H}_{18}\text{N}_4\text{O}_2^+$	$\text{B}_2\text{N}_4(\text{CH}_3)_2(\text{OCH}_3)_2$ (1,2,4,5,3,6-Tetrazadiborine, hexahydro-3,6-dimethoxy-1,2,4,5-tetramethyl-)	54154-15-3	**	7.35 (V)	PE	4299
$\text{BC}_6\text{H}_{12}\text{NO}_3^+$	$\text{N}(\text{CH}_2\text{CH}_2\text{O})_3\text{B}$ (2,8,9-Trioxa-5-aza-1-borabicyclo[3.3.3]undecane)	283-56-7	**	9.8 (V)	PE	4413
F^+						
$(^3\text{P}_2)$	$\text{F}(^2\text{P}_{3/2,1/2})$	14762-94-8	**	16.915	S	5247
$(^3\text{P}_1)$			**	17.418	S	5247
$(^3\text{P}_0)$			**	17.431	S	5247
$(^1\text{D}_2)$			**	19.927	S	5247
$(^3\text{P}_1)$			**	17.47 ± 0.02	PE	5087
$(^1\text{D}_2)$			**	20.05 ± 0.02	PE	5087
	F_2	7782-41-4	F	19.008	PI	3928
	SF_6	2551-62-4		37.5 ± 1.0	EI	4645
	CF_2Cl_2	75-71-8	$\text{CF}^- + 2\text{Cl}$	25.6 ± 0.2	PI	5399
	GeF_4	14929-46-5		33.0 ± 0.3	EI	5154
	AsF_3	7784-35-2	AsF_2	21.6 ± 0.3	EI	5016
			$\text{As} + \text{F}_2$	29.3 ± 0.2	EI	5016
			$\text{As} + 2\text{F}$	31.0	EI	5016
	AsF_5	7784-36-3	AsF_4	22.1 ± 0.2	EI	5016
F_2^+						
$(^2\Pi_g)$	F_2	7782-41-4	**	15.70 ± 0.02	S	3743
$(^2\Pi_g)$			**	15.694	PE	4655
$(^2\Pi_g)$			**	15.70	PE	3507
			**	15.70	PE	5313
$(^2\Pi_u)$			**	18.98 (V)	PE	3507
$(^2\Pi_u)$			**	18.45	OTH	3743
	SF_6	2551-62-4		18.0 ± 1.0	EI	4645
	AsF_3	7784-35-2	AsF	23.8 ± 0.1	EI	5016
HF^+						
	HF	7664-39-3	**	15.98 ± 0.04	PI	5015
			**	15.98 ± 0.04	PI	5307
$(^2\Pi)$			**	16.03 ± 0.01	PE	3500
$(^2\Pi)$			**	16.039	PE	4655
$(^2\Pi)$			**	16.044 ± 0.003	PE	5037
			**	16.06	PE	5313
$(^2\Pi)$			**	16.1	PE	4623
$(^2\Pi)$			**	16.12 ± 0.04 (V)	PE	4970
$(^2\Sigma)$			**	18.6	PE	4623
$(^2\Sigma)$			**	19.118	PE	3500
$(^2\Sigma)$			**	19.118	PE	4655
$(^2\Sigma)$			**	19.79 ± 0.05 (V)	PE	4970
$(^2\Sigma)$			**	39.0 (V)	PE	4623
$(^2\Sigma)$			**	39.30 ± 0.04 (V)	PE	4970
			**	16.05 ± 0.04	AUG	5231
$(^2\Pi)$			**	$16. \pm 1$	EI	4894
$(^2\Pi)$			**	16.05	EI	4879

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
DF⁺ (² Π) (² Π) (² Σ ⁺) (² Σ ⁺)	DF	14333-26-7	** ** ** **	16.058±0.003 16.058 19.162 19.172	PE PE PE PE	5037 4655 4655 3500
H₂F⁺	(HF) ₂	30664-12-1	F	15.65±0.04 15.65±0.06	PI PI	5307 5015
H₃F₂⁺	(HF) ₃	XXXXX-XX-X	F	14.85±0.09	PI	5307
H₄F₃⁺	(HF) ₄	XXXXX-XX-X	F	14.50±0.15	PI	5307
BeF⁺	BeF	13597-96-1	**	9.3±1.0	EI	4113
BeF₂⁺	BeF ₂	7787-49-7	**	14.5±1.0	EI	4113
BF⁺	BF	13768-60-0	**	12±1	EI	4054
BF₂⁺	BF ₂	13842-55-2	**	8±1	EI	3465
			**	9±1	EI	4054
	BF ₃	7637-07-2		15.92	PI	4997
				16	EI	4054
	H ₂ NBF ₂	50673-31-9		16.1±0.3	EI	4522
BF₃⁺	BF ₃	7637-07-2	** ** ** ** **	15.96±0.01 15.95 (V) 15.71±0.10 17±1 15.25	PE PE EI EI PE	4997 3704 3540 4054 5485
	(C ₂ H ₅) ₂ OBF ₃	109-63-7	(C ₂ H ₅) ₂ O	15.00±0.10	EI	3540
B₂F₄⁺	B ₂ F ₄	13965-73-6	**	≤12.23±0.06	PE	3709
CF⁺	CF	3889-75-6	** **	9.17±0.1 9.24	EI OTH	4544 3930
	CF ₃ C≡CC≡CCF ₃	10524-09-1		19.1±0.1	EI	4961
	C ₆ F ₆ (Benzene, hexafluoro-)	392-56-3		18.3±0.1	EI	4961
	C ₆ F ₆ (Bicyclo[2.2.0]hexa-2,5-diene, 1,2,3,4,5,6-hexafluoro-)	6733-01-3		15.6±0.5	EI	4961
	C ₂ H ₃ F	75-02-5	CH ₃	14.50±0.1	PE	4993
	CH ₂ =CF ₂	75-38-7	CH ₂ F	14.92±0.02	PI	3930
	cis-CHF=CHF	1630-77-9		14.4±0.1	PI	5241
	trans-CHF=CHF	1630-78-0		14.5±0.1	PI	5241
	CF ₃ Cl	75-72-9	Cl+F ₂	20.28±0.1	PI	5399
	C ₂ F ₃ Cl	79-38-9	CF ₂ Cl	16.7±0.1	EI	4070
	CF ₂ Cl ₂	75-71-8	Cl ₂ +F ⁻ F+Cl ₂ F+2Cl	15.30±0.3 17.65 20.20	PI PI PI	5399 5196 5196
	CFCl=CFCl	598-88-9	CFCl ₂	16.5±0.1	EI	4070
	CFCl ₃	75-69-4	3Cl	15.61±0.05	PI	5399

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
CF^+	CFCl_3	75-69-4	$\text{Cl}_2 + \text{Cl}$ 3Cl	15.7	PI	5196
				18.35	PI	5196
C_3F^+	C_6F_6 (Bicyclo[2.2.0]hexa-2,5-diene, 1,2,3,4,5,6-hexafluoro-)	6733-01-3		22.4 ± 0.5	EI	4961
C_5F^+	$\text{CF}_3\text{C}\equiv\text{CC}\equiv\text{CCF}_3$	10524-09-1		23.7 ± 0.5	EI	4961
CF_2^+ ($^2\text{A}_1$)	CF_2	2154-59-8	**	11.4 ± 0.3	EI	4544
				11.54 ± 0.1	EI	4554
				11.42 ± 0.01	PE	4239
				16.40 (V)	PE	4239
				17.4(V)	PE	4239
				19.2 (V)	PE	4239
				20.83 (V)	PE	4239
				22.2 (V)	PE	4239
				24.0 (V)	PE	4239
				11.54 ± 0.10	EI	3818
	C_2F_4 CF_3NO CF_3Cl	116-14-3 XXXXXX-XX-X 75-72-9	CF_2 FNO $\text{F}^- + \text{Cl}$ $\text{F} + \text{Cl}^-$ $\text{F} + \text{Cl}$ $\text{F} + \text{Cl}$ $\text{F} + \text{Cl}$ Cl_2 $\text{Cl} + \text{Cl}$ 2Cl	15.2 ± 0.1	EI	3539
				16.7 ± 0.2	EI	5220
				15.90 ± 0.3	PI	5399
				16.00 ± 0.1	PI	5399
				18.84	PI	4757
				18.85 ± 0.05	PI	5399
				18.85	PI	5196
				14.90 ± 0.3	PI	5399
				16.98	PI	4757
				17.22	PI	5196
C_2F_2^+	C_2F_2	689-99-6	**	11.18	PE	4681
				11.18	PE	5313
C_3F_2^+	$\text{CF}_3\text{C}\equiv\text{CC}\equiv\text{CCF}_3$	10524-09-1	$\text{F} + \text{C}_3\text{F}_3$	14.9 ± 0.4	EI	4961
				15.8 ± 0.1	EI	4961
	C_6F_6 (Benzene, hexafluoro-)	392-56-3				
				13.5 ± 0.5	EI	4961
C_4F_2^+	$(\text{CF}\equiv\text{C})_2$	64788-23-4	**	10.05	PE	5313
				10.35 (V)	PE	4681
	$\text{CF}_3\text{C}\equiv\text{CC}\equiv\text{CCF}_3$	10524-09-1		18.9 ± 0.5	EI	4961
				19.8 ± 0.5	EI	4961
	C_6F_6 (Benzene, hexafluoro-)	392-56-3				
				16.0 ± 0.5	EI	4961
C_5F_2^+	$\text{CF}_3\text{C}\equiv\text{CC}\equiv\text{CCF}_3$	10524-09-1		21.2 ± 0.5	EI	4961
				20.7 ± 0.1	EI	4961
	C_6F_6 (Benzene, hexafluoro-)	392-56-3				
				24.8 ± 0.4	EI	4961
	C_6F_6 (Bicyclo[2.2.0]hexa-2,5-diene, 1,2,3,4,5,6-hexafluoro-)	6733-01-3	$\text{F}_2 + \text{CF}_2$ $\text{F} + \text{CF}_3$	24.8 ± 0.4	EI	4961
				17.8 ± 0.5	EI	4961

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_3F_2^+$	C_6F_6	6733-01-3	$F_2 + CF_2$	$25. \pm 0.4$	EI	4961
			$F + CF_3$	$25. \pm 0.4$	EI	4961
CF_3^+	CF_3	2264-21-3	**	9.5	OTH	5554
	CF_4	75-73-0	F	14.7 ± 0.3	PI	5175
	$CF_3C \equiv CC \equiv CCF_3$	10524-09-1		17.6 ± 0.5	EI	4961
	C_6F_6 (Benzene, hexafluoro-)	392-56-3		15.3 ± 0.5	EI	4961
	C_6F_6 (Bicyclo[2.2.0]hexa-2,5-diene, 1,2,3,4,5,6-hexafluoro-)	6733-01-3	$CF + C_4F_2$	21.3 ± 0.4	EI	4961
			$CF + C_3 + CF_2$	25.2 ± 0.4	EI	4961
				16.5 ± 0.5	EI	4961
	CH_3CF_3	420-46-2	$CF + C_4F_2$	19.4 ± 0.4	EI	4961
			$CF + C_3 + CF_2$	22.7 ± 0.4	EI	4961
	$(CF_2 = CH)_2$	407-70-5	CH_3	13.94 ± 0.1	EI	3478
	$(CF_3)_2CO$	684-16-2	C_3H_2F	13.9 ± 0.1	EI	5554
	CH_3COCF_3	421-50-1		13.8	EI	3550
	CF_3NO	XXXXXX-XX-X	NO	14.6	EI	3550
	CF_3Cl	75-72-9	Cl	12.6 ± 0.1	EI	5220
	C_2F_5I	354-64-3		12.55	PI	5196
			Cl	12.65	PI	4757
			CF_2, I	13.73 ± 0.1	EI	4862
$C_2F_3^+$	C_2F_3Cl	79-38-9	Cl	15.4 ± 0.1	EI	4070
$C_3F_3^+$	$CF_3C \equiv CC \equiv CCF_3$	10524-09-1		15.0 ± 0.2	EI	4961
	C_6F_6 (Benzene, hexafluoro-)	392-56-3	C_3F_3	16.5 ± 0.4	EI	4961
	C_6F_6 (Bicyclo[2.2.0]hexa-2,5-diene, 1,2,3,4,5,6-hexafluoro-)	6733-01-3		17.1 ± 0.2	EI	4961
			$CF + C_2F_2$	21 ± 0.4	EI	4961
				15.0 ± 0.2	EI	4961
			C_3F_3	15.6 ± 0.4	EI	4961
			$CF + C_2F_2$	19.6 ± 0.4	EI	4961
$C_4F_3^+$	C_6F_6 (Bicyclo[2.2.0]hexa-2,5-diene, 1,2,3,4,5,6-hexafluoro-)	6733-01-3		16.8 ± 0.2	EI	4961
$C_5F_3^+$	$CF_3C \equiv CC \equiv CCF_3$	10524-09-1		14.8 ± 0.2	EI	4961
			CF_3	$15. \pm 0.4$	EI	4961
			$F + CF_2$	18.4 ± 0.4	EI	4961
			$F + CF_2$	18.5 ± 0.4	EI	4961
			$CF + F_2$	23.6 ± 0.4	EI	4961
	C_6F_6 (Benzene, hexafluoro-)	392-56-3		15.8 ± 0.1	EI	4961
			CF_3	16.1 ± 0.4	EI	4961
			$F + CF_2$	18.8 ± 0.4	EI	4961
	C_6F_6 (Bicyclo[2.2.0]hexa-2,5-diene, 1,2,3,4,5,6-hexafluoro-)	6733-01-3	$F + CF_2$	18.8 ± 0.4	EI	4961
				13.8 ± 0.1	EI	4961
			CF_3	$15. \pm 0.4$	EI	4961
			$F + CF_2$	17.5 ± 0.4	EI	4961
			$F + CF_2$	17.7 ± 0.4	EI	4961
CF_4^+	CF_4	75-73-0	**	16.25 ± 0.04 (V)	PE	3880

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_2F_4^+$	C_2F_4	116-14-3	**	10.10	PE	3649
			**	10.14	PE	5408
			**	10.32	PE	3589
			**	10.52 (V)	PE	4084
			**	10.56±0.02 (V)	PE	5017
	$C_4H_4F_4$ (Cyclobutane, 1,1,2,2-tetrafluoro-)	374-12-9	C_2H_4	12.60	EI	4553
$C_3F_4^+$	1,2- C_3F_4	461-68-7	**	11.24 (V)	PE	5105
$C_4F_4^+$	$CF_2=C=C=CF_2$	2252-95-1	**	9.30 (V)	PE	4738
$C_5F_4^+$	$CF_3C\equiv CC\equiv CF$	64788-24-5	**	10.85 (V)	PE	4681
	$CF_3C\equiv CC\equiv CCF_3$	10524-09-1		14.2±0.2	EI	4961
	C_6F_6 (Benzene, hexafluoro-)	392-56-3	CF_2	15.5±0.4	EI	4961
			CF_2	16.3±0.4	EI	4961
	C_6F_6 (Bicyclo[2.2.0]hexa-2,5-diene, 1,2,3,4,5,6-hexafluoro-)	6733-01-3		16.4±0.2	EI	4961
				13.8±0.2	EI	4961
$C_6F_4^+$	$CF_3C\equiv CC\equiv CCF_3$	10524-09-1		14.8±0.4	EI	4961
$C_2F_5^+$	C_2F_5I	354-64-3	I	11.71±0.1	EI	4862
$C_3F_5^+$	C_6F_6 (Benzene, hexafluoro-)	392-56-3		16.4±0.2	EI	4961
	C_6F_6 (Bicyclo[2.2.0]hexa-2,5-diene, 1,2,3,4,5,6-hexafluoro-)	6733-01-3		18.5±0.2	EI	4961
$C_6F_5^+$	$CF_3C\equiv CC\equiv CCF_3$	10524-09-1		14.8±0.2	EI	4961
	C_6F_6 (Benzene, hexafluoro-)	392-56-3	F	15.1±0.4	EI	4961
			F	16.86±0.05	EI	4127
				17.2±0.2	EI	4961
	C_6F_6 (Bicyclo[2.2.0]hexa-2,5-diene, 1,2,3,4,5,6-hexafluoro-)	6733-01-3		14.6±0.2	EI	4961
	C_6F_5Cl (Benzene, chloropentafluoro-)	344-07-0	Cl	15.85±0.05	EI	4127
	C_6F_5Br (Benzene, bromopentafluoro-)	344-04-7	Br	14.93±0.05	EI	4127
	C_6F_5I (Benzene, pentafluoroiodo-)	827-15-6	I	13.21±0.05	EI	4127
$C_2F_6^+$	C_2F_6	76-16-4	**	14.6 (V)	PE	4321
$C_3F_6^+$	$CF_3CF=CF_2$	116-15-4	**	10.62	PE	3589
			**	10.62	PE	4165
$C_4F_6^+$	$CF_3C\equiv CCF_3$	692-50-2	**	12.31	PE	3589

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_4F_6^+$	$CF_3C\equiv CCF_3$	692-50-2	**	12.35 ± 0.01	PE	4633
$C_6F_6^+$	$CF_3C\equiv CC\equiv CCF_3$	10524-09-1	**	10.99 ± 0.01	PE	4633
			**	11.5 ± 0.1	EI	4961
	C_6F_6 (Benzene, hexafluoro-)	392-56-3	**	9.90 ± 0.01	S	3559
			**	9.90 ± 0.05	PE	4821
			**	9.90 (V)	PE	3873
			**	9.91	PE	5408
			**	9.93	PE	3637
			**	10.09 (V)	PE	4884
			**	10.14 (V)	PE	5252
			**	10.2 ± 0.1	EI	4961
			**	10.09 (V)	PE	4472
	C_6F_6 (Bicyclo[2.2.0]hexa-2,5-diene, 1,2,3,4,5,6-hexafluoro-)	6733-01-3	**	10.08 ± 0.05	PE	4414
			**	10.4 (V)	PE	4453
			**	10.4 ± 0.1	EI	4961
$C_4F_8^+$	<i>cis</i> -2- C_4F_8	1516-65-0	**	11.46 (V)	PE	4084
	<i>trans</i> -2- C_4F_8	1516-64-9	**	11.55 (V)	PE	3649
			**	11.55 (V)	PE	4084
$C_7F_8^+$	$C_6F_5CF_3$ (Benzene, pentafluoro(trifluoromethyl)-)	434-64-0	**	9.9	PE	5521
			**	9.9 (V)	PE	5461
$C_{10}F_8^+$	$C_{10}F_8$ (Naphthalene, octafluoro-)	313-72-4	**	8.85	PE	3637
			**	8.90 ± 0.05	PE	4821
$C_{12}F_8^+$	$C_{12}F_8$ (Acenaphthylene, octafluoro-)	1554-93-4	**	9.1 ± 0.1 (V)	PE	4821
$C_8F_{10}^+$	$C_6F_4(CF_3)_2$ (Benzene, 1,2,4,5-tetrafluoro-3,6-bis(trifluoromethyl)-)	651-89-8	**	9.9	PE	5521
			**	9.9 (V)	PE	5461
$C_{12}F_{10}^+$	$(C_6F_5)_2$ (1,1'-Biphenyl, decafluoro-)	434-90-2	**	9.40 ± 0.02	PE	3702
$C_{14}F_{10}^+$	$C_{14}F_{10}$ (Anthracene, decafluoro-)	1580-19-4	**	8.28 ± 0.05	PE	4821
	$C_{14}F_{10}$ (Phenanthrene, decafluoro-)	1580-20-7	**	8.75 ± 0.05	PE	4821
$C_{16}F_{10}^+$	$C_{16}F_{10}$ (Pyrene, decafluoro-)	1493-68-1	**	8.36 ± 0.05	PE	4821
$C_6F_{12}^+$	$(CF_3)_2C=C(CF_3)_2$	360-57-6	**	12.61 (V)	PE	4084

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
CHF⁺	<i>cis</i> -CHF=CHF	1630-77-9	CHF	18.1±0.2	PI	5241
	<i>trans</i> -CHF=CHF	1630-78-0	CHF	18.1±0.2	PI	5241
CH₂F⁺	CH ₂ F	3744-29-4	**	8.90	EI	3732
			**	9.16±0.02	OTH	3930
	CH ₂ F ₂	75-10-5	F	14.06	EI	3732
	CH ₂ =CF ₂	75-38-7	CF	14.84±0.02	PI	3930
	<i>cis</i> -CHF=CHF	1630-77-9	CF	14.3±0.1	PI	5241
	<i>trans</i> -CHF=CHF	1630-78-0	CF	14.3±0.1	PI	5241
C₂HF⁺	C ₂ HF	2713-09-9	**	11.26	PE	5313
	C ₂ H ₃ F	75-02-5	H ₂	13.72±0.02	PI	3930
				13.72	PI	5352
			H ₂	13.70±0.1	PE	4993
	CH ₂ =CF ₂	75-38-7	HF	14.18±0.03	PI	3930
	<i>trans</i> -CHF=CHF	1630-78-0	HF	13.7±0.1	PI	5241
C₂H₂F⁺	C ₂ H ₃ F	75-02-5	H	13.56±0.04	PI	3930
			H	13.56	PI	5352
			H	13.55	PE	4993
	CH ₂ =CF ₂	75-38-7	F	14.37±0.02	PI	3930
	<i>cis</i> -CHF=CHF	1630-77-9	F	13.9±0.1	PI	5241
	<i>trans</i> -CHF=CHF	1630-78-0	F	13.9±0.1	PI	5241
	CH ₂ =CFCl	2317-91-1	Cl	13.7±0.1	EI	4070
C₂H₃F⁺	C ₂ H ₃ F	75-02-5	**	10.35±0.01	PI	3930
			**	10.363±0.015	PI	5616
			**	10.3	PE	4993
			**	10.36	PE	5408
			**	10.37	PE	5352
			**	10.56±0.02 (V)	PE	5017
	(CH ₃) ₂ CHF	420-26-8	CH ₄	11.53±0.03	PI	5003
C₂H₄F⁺	CH ₃ CHF	29526-61-2	**	7.93	PI	5003
	C ₂ H ₅ F	353-36-6	H	12.04±0.03	PI	5003
	(CH ₃) ₂ CHF	420-26-8	CH ₃	11.75±0.03	PI	5003
	CH ₃ CHF ₂	75-37-6	F	14.80±0.1	EI	3478
C₂H₅F⁺	C ₂ H ₅ F	353-36-6	**	12.43 (V)	PE	3984
			**	12.43 (V)	PE	4321
			**	12.43 (V)	PE	5088
C₃HF⁺	CHF ₂ C≡CH	18371-25-0	HF	12.6±0.15	EI	3769
C₃H₂F⁺	CHF ₂ C≡CH	18371-25-0	F	14.2±0.2	EI	3769
	(CF ₂ =CH) ₂	407-70-5	CF ₃	12.4±0.1	EI	5554
C₃H₃F⁺	CH ₂ FC≡CH	2805-22-3	**	10.95 (V)	PE	4684
C₃H₄F⁺	C ₃ H ₄ F ₄	374-12-9	CF ₃	12.85	EI	4553
	(Cyclobutane, 1,1,2,2-tetrafluoro-)					

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_3H_3F^+$	$CH_2=CHCH_2F$	818-92-8	**	10.11	PE	3863
			**	10.38 (V)	PE	4260
			**	10.56 (V)	PE	4091
$C_3H_6F^+$	$(CH_3)_2CF$	14665-81-7	**	7.14	PI	5003
	$(CH_3)_2CHF$	420-26-8	H	11.23 ± 0.03	PI	5003
$C_3H_7F^+$	$(CH_3)_2CHF$	420-26-8	**	11.08 ± 0.02	PI	5003
	$n-C_3H_7F$	460-13-9	**	11.96 (V)	PE	3984
C_4HF^+	$CF \equiv CC \equiv CH$	XXXXXX-XX-X	**	10.10	PE	5313
$C_6H_4F^+$	$C_6H_4(F)COOH$ (Benzoic acid, 3-fluoro-)	455-38-9	$CO + OH$	15.25 ± 0.2	EI	3973
	$C_6H_4(F)COOH$ (Benzoic acid, 4-fluoro-)	456-22-4	$CO + OH$	15.33 ± 0.2	EI	3973
	$C_6H_4FNO_2$ (Benzene, 1-fluoro-3-nitro-)	402-67-5	NO_2	12.22 ± 0.1	EI	3447
	$C_6H_4FNO_2$ (Benzene, 1-fluoro-4-nitro-)	350-46-9	NO_2	12.37 ± 0.1	EI	3447
$C_6H_5F^+$	C_6H_5F (Benzene, fluoro-)	462-06-6	**	9.20	S	3559
			**	9.11	PE	3955
			**	9.17	PE	4621
			**	9.19 (V)	PE	3873
			**	9.22	PE	5408
			**	9.22 (V)	PE	5125
			**	9.35 ± 0.03 (V)	PE	3713
			**	9.37 (V)	PE	4884
			**	9.75	EI	4834
	$C_6H_5FOCH_3$ (Benzene, 1-fluoro-3-methoxy-)	456-49-5	CH_2O	11.76 ± 0.1	EI	3446
	$C_6H_5FOCH_3$ (Benzene, 1-fluoro-4-methoxy-)	459-60-9	CH_2O	11.55 ± 0.1	EI	3446
$C_7H_6F^+$	$C_6H_5FC_4H_9$ (Benzene, 1-butyl-3-fluoro-)	20651-66-5		11.69 ± 0.1	EI	3629
	$C_6H_5FC_4H_9$ (Benzene, 1-butyl-4-fluoro-)	20651-65-4		11.25 ± 0.1	EI	3629
$C_7H_7F^+$	$C_6H_5CH_2F$ (Benzene, (fluoromethyl)-)	350-50-5	**	9.55 (V)	PE	3992
	$C_6H_5FC_4H_9$ (Benzene, 1-butyl-3-fluoro-)	20651-66-5	$CH_2=CHCH_3$	10.21 ± 0.1	EI	3629
	$C_6H_5FC_4H_9$ (Benzene, 1-butyl-4-fluoro-)	20651-65-4	$CH_2=CHCH_3$	10.29 ± 0.1	EI	3629
$C_{10}H_{13}F^+$	$C_6H_5FC_4H_9$ (Benzene, 1-butyl-3-fluoro-)	20651-66-5	**	9.19 ± 0.1	EI	3629
	$C_6H_5FC_4H_9$ (Benzene, 1-butyl-4-fluoro-)	20651-65-4	**	9.15 ± 0.1	EI	3629

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{10}H_{15}F^+$	$C_{10}H_{15}F$ (Tricyclo[3.3.1.1 ^{3,7}]decane, 2-fluoro-)	16668-83-0	**	9.46	PE	3886
$C_{11}H_9F^+$	$C_{11}H_9(F)$ (1,4-Methanonaphthalene, 5-fluoro-1,4-dihydro-)	61346-81-4	**	8.66 ± 0.05 (V)	PE	5019
	$C_{11}H_9(F)$ (1,4-Methanonaphthalene, 6-fluoro-1,4-dihydro-)	58653-71-7	**	8.62 ± 0.05 (V)	PE	5019
$C_{12}H_9F^+$	$C_6H_5-C_6H_4F$ (1,1'-Biphenyl, 2-fluoro-)	321-60-8	**	8.20 ± 0.02	PE	3702
	$C_6H_5-C_6H_4F$ (1,1'-Biphenyl, 4-fluoro-)	324-74-3	**	8.00 ± 0.02	PE	3702
$C_{14}H_9F^+$	$C_{14}H_9F$ (Anthracene, 9-fluoro-)	529-85-1	**	7.46 ± 0.03 (V)	PE	4887
CHF_2^+	CHF_2	2670-13-5	**	≤ 8.90	EI	3732
			**	9.45	OTH	5554
	CH_2F_2	75-10-5	H	13.11	EI	3732
	$CHF_2C \equiv CH$	18371-25-0	C_2H	13.8 ± 0.1	EI	3769
	$(CF_2 = CH)_2$	407-70-5	C_3F_2H	14.3 ± 0.1	EI	5554
$C_2HF_2^+$	$CH_2 = CF_2$	75-38-7	H	15.80 ± 0.04	PI	3930
	<i>cis</i> -CHF=CHF	1630-77-9	H	14.9 ± 0.2	PI	5241
	<i>trans</i> -CHF=CHF	1630-78-0	H	15.4 ± 0.2	PI	5241
$C_2H_2F_2^+$	$CH_2 = CF_2$	75-38-7	**	10.29 ± 0.01	PI	3930
			**	10.29	PE	5408
			**	10.69 ± 0.02 (V)	PE	5017
	<i>cis</i> -CHF=CHF	1630-77-9	**	10.23	PE	5408
			**	10.43 (V)	PE	3649
			**	10.44 ± 0.02 (V)	PE	5017
	<i>trans</i> -CHF=CHF	1630-78-0	**	10.21	PE	5408
			**	10.38 ± 0.02 (V)	PE	5017
			**	10.38 (V)	PE	3649
	$(CH_3)_2CF_2$	420-45-1	CH_4	11.57 ± 0.03	PI	5003
	$C_4H_4F_4$	374-12-9	$C_2H_2F_2$	12.15	EI	4553
	(Cyclobutane, 1,1,2,2-tetrafluoro-)					
$C_2H_3F_2^+$	CH_3CF_2	40640-67-3	**	7.92	PI	5003
	CH_3CHF_2	75-37-6	H	12.18 ± 0.03	PI	5003
	$(CH_3)_2CF_2$	420-45-1	CH_3	11.81 ± 0.03	PI	5003
	CH_3CF_3	420-46-2	F	15.14 ± 0.1	EI	3478
$C_2H_4F_2^+$	CH_3CHF_2	75-37-6	**	12.8 (V)	PE	4321
$C_3HF_2^+$	$CHF_2C \equiv CH$	18371-25-0	H	12.9 ± 0.1	EI	3769
	$(CF_2 = CH)_2$	407-70-5	CF_2H	14.0 ± 0.1	EI	5554
$C_3H_2F_2^+$	$CF_2 = C = CH_2$	430-64-8	**	9.79 ± 0.03	PE	4833
	$CHF_2C \equiv CH$	18371-25-0	**	11.6 ± 0.1	EI	3769
	(1,2-Propadiene, 1,1-difluoro-)					

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_3H_2F_2^+$	$(CF_2=CH)_2$	407-70-5	CF_2	14.4 ± 0.2	EI	5554
$C_3H_6F_2^+$	$(CH_3)_2CF_2$	420-45-1	**	11.42 ± 0.02	PI	5003
$C_6H_4F_2^+$	$C_6H_4F_2$ (Benzene, 1,2-difluoro-)	367-11-3	**	9.30	S	4271
			**	9.30 (V)	PE	3873
			**	9.6 ± 0.03 (V)	PE	3713
	$C_6H_4F_2$ (Benzene, 1,3-difluoro-)	372-18-9	**	9.35	S	4271
			**	9.32 (V)	PE	3873
			**	9.6 ± 0.03 (V)	PE	3713
	$C_6H_3F_2$ (Benzene, 1,4-difluoro-)	540-36-3	**	9.18	S	4271
			**	9.15 (V)	PE	3873
			**	9.29	PE	5408
			**	9.4 ± 0.03 (V)	PE	3713
$C_{12}H_8F_2^+$	$(C_6H_4F)_2$ (1,1'-Biphenyl, 2,2'-difluoro-)	388-82-9	**	8.35 ± 0.02	PE	3702
	$(C_6H_4F)_2$ (1,1'-Biphenyl, 3,3'-difluoro-)	396-64-5	**	8.35 ± 0.02	PE	3702
	$(C_6H_4F)_2$ (1,1'-Biphenyl, 4,4'-difluoro-)	398-23-2	**	8.00 ± 0.02	PE	3702
CHF_3^+	CF_3H	75-46-7	**	14.8 ± 0.05 (V)	PE	5419
$C_2HF_3^+$	C_2HF_3	359-11-5	**	10.14	PE	5408
			**	10.53 (V)	PE	3649
			**	10.54 ± 0.02 (V)	PE	5017
$C_2H_3F_3^+$	CH_3CF_3	420-46-2	**	13.26 ± 0.1	EI	3478
			**	13.8 (V)	PE	4321
$C_3HF_3^+$	$CF_3C \equiv CH$	661-54-1	**	11.83	PE	3589
			**	11.96 ± 0.02	PE	4765
$C_4H_2F_3^+$	$(CF_2=CH)_2$	407-70-5	F	15.2 ± 0.1	EI	5554
$C_4H_4F_3^+$	$C_4H_4F_4$ (Cyclobutane, 1,1,2,2-tetrafluoro-)	374-12-9	F^-	13.5 ± 1	EI	4553
$C_6H_3F_3^+$	$C_6H_3F_3$ (Benzene, 1,3,5-trifluoro-)	372-38-3	**	9.26 (V)	PE	3873
			**	9.64	PE	3764
			**	9.64	PE	5408
$C_7H_5F_3^+$	$C_6H_5CF_3$ (Benzene, (trifluoromethyl)-)	98-08-8	**	9.68	PE	4621

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_9H_9F_3^+$	$C_9F_3(CH_3)_3$ (Benzene, 1,3,5-trifluoro-2,4,6-trimethyl-)	363-64-4	**	8.76 ± 0.02	PE	5521
			**	8.76 (V)	PE	5461
$C_4H_2F^+$	$(CF_2=CH)_2$	407-70-5	**	10.6 ± 0.1	EI	5554
$C_6H_2F_4^+$	$C_6H_2F_4$ (Benzene, 1,2,3,4-tetrafluoro-)	551-62-2	**	9.56 (V)	PE	3873
			**	9.60	PE	5408
	$C_6H_2F_4$ (Benzene, 1,2,3,5-tetrafluoro-)	2367-82-0	**	9.56 (V)	PE	3873
			**	9.36 (V)	PE	3873
$C_7H_4F_4^+$	$C_6HF_3CH_3$ (Benzene, 1,2,4,5-tetrafluoro-3-methyl-)	5230-78-4	**	9.16 ± 0.02	PE	5521
			**	9.16 (V)	PE	5461
$C_6HF_5^+$	C_6HF_5 (Benzene, pentafluoro-)	363-72-4	**	9.82	S	3559
			**	9.64 (V)	PE	3873
			**	9.73	PE	5408
			**	9.90 (V)	PE	5252
$C_7H_3F_5^+$	$C_6F_5CH_3$ (Benzene, pentafluoromethyl-)	771-56-2	**	9.4	PE	5521
			**	9.4 (V)	PE	5461
			**	9.81 (V)	PE	5252
$C_8H_3F_5^+$	$C_6F_5CH=CH_2$ (Benzene, ethenylpentafluoro-)	653-34-9	**	9.18 ± 0.02	PE	3854
$C_{16}H_8F_8^+$	$C_{16}H_8F_8$ (Tricyclo[8.2.2.2 ^{4,7}]hexadeca-4,6,10,12,13,15-hexaene, 2,2,3,3,8,8,9,9-octafluoro-)	3345-29-7	**	8.90	PE	4158
$BCH_3F_2^+$	CH_3BF_2 (Borane, difluoromethyl)	373-64-8	**	13.16 (V)	PE	5485
$BC_2H_6F^+$	$(CH_3)_2BF$	353-46-8	**	11.22 (V)	PE	4243
			**	11.25 (V)	PE	5485
$BC_6H_5F_2^+$	$C_6H_5BF_2$ (Borane, difluorophenyl-)	368-98-9	**	9.61 (V)	PE	4956
$BC_{21}H_{15}F_4^+$	$C_3(C_6H_5)_3BF_4$ (Cyclopropenium, triphenyl-, tetrafluoroborate(1-))	741-16-2	**	8.65 ± 0.05	EI	4628
NF^+	NF_2	3744-07-8	F^-	11.86 ± 0.2	EI	3785

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
NF ⁺	NF ₂	3744-07-8	F	15.46±0.2	EI	3785
	N ₂ F ₄	10036-47-2	NF ₂ +F	16.6	EI	3785
	(CH ₃) ₂ C(NF ₂) ₂	19309-63-8		13.9±0.3	EI	3634
	(CH ₂ NF ₂) ₂ CH ₂	21298-22-6		13.0±0.3	EI	3634
N ₂ F ⁺	N ₂ F ₄	10036-47-2	F ₂ +F	14.2±0.3	EI	3785
			3F	16.7±0.3	EI	3785
NF ₂ ⁺	NF ₂	3744-07-8	**	12.1±0.1 (V)	PE	3671
			**	12.1	PE	3693
			**	14.6±0.1 (V)	PE	3671
			**	14.6	PE	3693
			**	16.4	PE	3693
			**	17.6	PE	3693
	N ₂ F ₄	10036-47-2	**	11.76±0.1	EI	3785
			F ⁻ +NF	12.40±0.1	EI	3785
			NF ₂	12.70±0.1	EI	3785
	(CH ₃) ₂ C(NF ₂) ₂	19309-63-8		13.9±0.4	EI	3634
	(CH ₂ NF ₂) ₂ CH ₂	21298-22-6		14.8±0.4	EI	3634
N ₂ F ₂ ⁺	<i>trans</i> -N ₂ F ₂	13776-62-0	**	12.8	PE	3649
	N ₂ F ₄	10036-47-2	2F	16.0±0.1	EI	3785
NF ₃ ⁺	NF ₃	7783-54-2	**	12.97±0.04	PE	3641
			**	13.18±0.1	EI	3578
N ₂ F ₄ ⁺	N ₂ F ₄	10036-47-2	**	12.00±0.1	EI	3785
HNF ₂ ⁺	HNF ₂	10405-27-3	**	11.53±0.08	PE	5253
HBNF ⁺	H ₂ NBF ₂	50673-31-9	HF	14.0±0.2	EI	4522
H ₂ BNF ⁺	H ₂ NBF ₂	50673-31-9	F	16.1±0.4	EI	4522
H ₂ BNF ₂ ⁺	H ₂ NBF ₂	50673-31-9	**	12.4±0.4	EI	4522
H ₃ B ₃ N ₃ F ₃ ⁺	B ₃ H ₃ N ₃ F ₃ (Borazine, 2,4,6-trifluoro-)	13779-24-3	**	10.46	PE	3637
			**	10.66 (V)	PE	3673
			**	10.66 (V)	PE	3943
CNF ⁺	FCN	1495-50-7	**	13.34±0.02	PE	4676
			**	14.48±0.02	PE	4676
			**	19.3±0.1 (V)	PE	4676
			**	22.6±0.1 (V)	PE	4676
C ₃ NF ⁺	CF≡CCN	32038-83-8	**	11.51±0.02	PE	4765

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
CN_2F_2^+	CF_2N_2 (3 <i>H</i> -Diazirine, 3,3-difluoro-)	693-85-6	**	11.2	PE	3727
C_4NF_3^+	$\text{CF}_3\text{C}\equiv\text{CCN}$	66051-48-7	**	12.00 ± 0.02	PE	4765
$\text{C}_3\text{N}_3\text{F}_3^+$	$\text{C}_3\text{N}_3\text{F}_3$ (1,3,5-Triazine, 2,4,6-trifluoro-)	675-14-9	**	11.5	PE	3637
$\text{C}_4\text{N}_2\text{F}_4^+$	$\text{C}_3\text{F}_4\text{N}_2$ (Pyrazine, tetrafluoro-)	13177-77-0	**	10.34 (V)	PE	4330
			**	10.37 (V)	PE	5530
	$\text{C}_3\text{F}_4\text{N}_2$ (Pyridazine, tetrafluoro-)	7627-80-7	**	10.70 (V)	PE	4330
			**	11.15	PE	5530
	$\text{C}_3\text{F}_4\text{N}_2$ (Pyrimidine, tetrafluoro-)	767-79-3	**	10.75 (V)	PE	4330
			**	10.82 (V)	PE	5530
$\text{C}_8\text{N}_2\text{F}_4^+$	$\text{C}_6\text{F}_4(\text{CN})_2$ (1,2-Benzenedicarbonitrile, 3,4,5,6-tetrafluoro-)	1835-65-0	**	10.60 (V)	PE	4969
	$\text{C}_6\text{F}_4(\text{CN})_2$ (1,4-Benzenedicarbonitrile, 2,3,5,6-tetrafluoro-)	1835-49-0	**	10.65 (V)	PE	4969
C_5NF_5^+	$\text{C}_5\text{F}_5\text{N}$ (Pyridine, pentafluoro-)	700-16-3	**	10.07	PE	4867
			**	10.08	PE	3637
C_7NF_5^+	$\text{C}_6\text{F}_5\text{CN}$ (Benzonitrile, pentafluoro-)	773-82-0	**	10.1	PE	5521
			**	10.1 (V)	PE	5461
			**	10.45 (V)	PE	4969
$\text{C}_2\text{N}_2\text{F}_6^+$	<i>cis</i> - $\text{CF}_3\text{N}=\text{NCF}_3$	XXXXX-XX-X	**	10.5	PE	3649
$\text{C}_6\text{F}_6\text{N}_2^+$	$\text{C}_6\text{F}_6\text{N}_2$	2167-31-9	**	11.85 ± 0.05 (V)	PE	4859
$\text{C}_8\text{N}_2\text{F}_6^+$	$\text{C}_8\text{N}_2(\text{F})_6$ (Cinnoline, hexafluoro-)	28734-86-3	**	9.66 (V)	PE	3959
	$\text{C}_8\text{N}_2\text{F}_6$ (1,8-Naphthyridine, 2,3,4,5,6,7-hexafluoro-)	56595-12-1	**	~ 10.01 (V)	PE	4523
	$\text{C}_8\text{N}_2\text{F}_6$ (2,7-Naphthyridine, 1,3,4,5,6,8-hexafluoro-)	56595-14-3	**	9.50 (V)	PE	4523
	$\text{C}_8\text{N}_2(\text{F})_6$ (Phthalazine, hexafluoro-)	25732-35-8	**	9.90 (V)	PE	3959
	$\text{C}_8\text{N}_2(\text{F})_6$ (Quinazoline, hexafluoro-)	28734-87-4	**	9.43 (V)	PE	3959
	$\text{C}_8\text{N}_2(\text{F})_6$ (Quinoxaline, hexafluoro-)	21271-15-8	**	9.65 (V)	PE	3959
C_9NF_7^+	C_9NF_7 (Isoquinoline, heptafluoro-)	13180-39-7	**	9.29 (V)	PE	3723

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₉NF₇⁺	C ₉ NF ₇ (Quinoline, heptafluoro-)	13180-38-6	**	9.51 (V)	PE	3723
CH₂NF⁺	CH ₂ (NF ₂)CH(NF ₂)CH ₃	15403-25-5	CH ₃ C(NF ₂)FH?	11.5±0.2	EI	3634
	(CH ₂ NF ₂) ₂ CH ₂	21298-22-6		11.9±0.2	EI	3634
C₂H₂NF⁺	CH ₂ FCN	503-20-8	**	12.67 (V)	PE	4684
C₂H₃NF⁺	(CH ₂ NF ₂) ₂ CH ₂	21298-22-6		16.8±0.4	EI	3634
C₃H₆NF⁺	CH ₂ (NF ₂)CH(NF ₂)CH ₃	15403-25-5		14.6±0.3	EI	3634
C₆H₆NF⁺	C ₆ H ₄ (F)(NH ₂) (Benzenamine, 2-fluoro-)	348-54-9	**	8.18 (V)	PE	4893
			**	8.50	EI	4834
	C ₆ H ₃ (F)(NH ₂) (Benzenamine, 3-fluoro-)	372-19-0	**	8.32 (V)	PE	4893
	C ₆ H ₃ (F)(NH ₂) (Benzenamine, 4-fluoro-)	371-40-4	**	8.18 (V)	PE	4893
	C ₆ H ₃ FNHCOCH ₃ (Acetamide, <i>N</i> -(2-fluorophenyl)-)	399-31-5	CH ₂ =C=O	9.80±0.03	EI	3483
	C ₆ H ₃ FNHCOCH ₃ (Acetamide, <i>N</i> -(4-fluorophenyl)-)	351-83-7	CH ₂ =C=O	10.12±0.03	EI	3483
C₇H₄NF⁺	C ₆ H ₃ F(CN) (Benzonitrile, 2-fluoro-)	394-47-8	**	9.78 (V)	PE	5259
	C ₆ H ₃ F(CN) (Benzonitrile, 3-fluoro-)	403-54-3	**	9.79 (V)	PE	5259
	C ₆ H ₃ F(CN) (Benzonitrile, 4-fluoro-)	1194-02-1	**	9.74 (V)	PE	5259
C₁₃H₁₀NF⁺	C ₆ H ₄ FC(=CH ₂)C ₅ H ₄ N (Pyridine, 2-[1-(2-fluorophenyl)ethenyl]-)	XXXXX-XX-X	**	8.66	EI	5570
	C ₆ H ₃ FC(=CH ₂)C ₅ H ₄ N (Pyridine, 2-[1-(4-fluorophenyl)ethenyl]-)	XXXXX-XX-X	**	8.68	EI	5570
C₄H₃N₂F⁺	C ₄ H ₃ FN ₂ (Pyrimidine, 2-fluoro-)	31575-35-6	**	10.5	PE	5530
C₈H₅N₂F⁺	C ₈ H ₃ N ₂ F (Quinazoline, 2-fluoro-)	56595-08-5	**	9.15 (V)	PE	4523
	C ₈ H ₃ N ₂ F (Quinazoline, 4-fluoro-)	56595-09-6	**	9.22 (V)	PE	4523
C₉H₁₀N₂F⁺	C ₆ H ₄ (F)N=CHN(CH ₃) ₂ (Methanimidamide, <i>N'</i> -(2-fluorophenyl)- <i>N,N</i> -dimethyl-)	53666-09-4	H	9.0	EI	4337
C₉H₁₁N₂F⁺	C ₆ H ₄ (F)N=CHN(CH ₃) ₂ (Methanimidamide, <i>N'</i> -(2-fluorophenyl)- <i>N,N</i> -dimethyl-)	53666-09-4	**	7.6	EI	4337

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
CHNF₂⁺	(CH ₃) ₂ C(NF ₂) ₂	19309-63-8		13.2±0.3	EI	3634
	(CH ₂ NF ₂) ₂ CH ₂	21298-22-6		13.7±0.3	EI	3634
CH₂NF₂⁺	CH ₃ (NF ₂)CH(NF ₂)CH ₃	15403-25-5		13.1±0.2	EI	3634
	(CH ₂ NF ₂) ₂ CH ₂	21298-22-6		13.6±0.3	EI	3634
C₂H₆NF₂⁺	CH ₃ (NF ₂)CH(NF ₂)CH ₃	15403-25-5		10.8±0.2	EI	3634
	(CH ₃) ₂ C(NF ₂) ₂	19309-63-8		11.1±0.3	EI	3634
	(CH ₂ NF ₂) ₂ CH ₂	21298-22-6		11.8±0.3	EI	3634
C₆H₅NF₂⁺	C ₆ H ₃ F ₂ NHCOCH ₃ (Acetamide, <i>N</i> -(2,4-difluorophenyl)-)	399-36-0	CH ₂ =C=O	9.70±0.03	EI	3480
	C ₆ H ₃ F ₂ NHCOCH ₃ (Acetamide, <i>N</i> -(2,6-difluorophenyl)-)	3896-29-5	CH ₂ =C=O	9.52±0.03	EI	3480
C₄H₂N₂F₂⁺	C ₄ H ₂ F ₂ N ₂ (Pyrazine, 2,3-difluoro-)	52751-15-2	**	10.35 (V)	PE	5530
	C ₄ H ₂ F ₂ N ₂ (Pyrazine, 2,6-difluoro-)	33873-09-5	**	10.30 (V)	PE	5530
	C ₄ H ₂ F ₂ N ₂ (Pyridazine, 3,6-difluoro-)	33097-39-1	**	10.17	PE	5530
	C ₄ H ₂ F ₂ N ₂ (Pyrimidine, 2,4-difluoro-)	2802-61-1	**	10.65 (V)	PE	5530
	C ₄ H ₂ F ₂ N ₂ (Pyrimidine, 4,6-difluoro-)	2802-62-2	**	10.95 (V)	PE	5530
C₈H₄N₂F₂⁺	C ₈ H ₄ N ₂ F ₂ (1,8-Naphthyridine, 2,7-difluoro-)	56595-11-0	**	9.26 (V)	PE	4523
	C ₈ H ₄ N ₂ F ₂ (Quinazoline, 2,4-difluoro-)	56595-10-9	**	9.30 (V)	PE	4523
	C ₈ H ₄ N ₂ (F) ₂ (Quinoxaline, 2,3-difluoro-)	7066-36-6	**	9.30 (V)	PE	3959
C₉H₉N₃F₂⁺	C ₆ H ₃ F ₂ NC ₃ H ₄ N ₂ H ₂ (Imidazolidine, 2-(2,6-difluorophenylimino)-)	XXXXXX-XX-X	**	8.12 (V)	PE	5545
C₆H₄NF₃⁺	C ₅ H ₄ N(CF ₃) (Pyridine, 4-(trifluoromethyl)-)	XXXXXX-XX-X	**	10.1 (V)	PE	4536
C₁₁H₁₀NF₃⁺	C ₆ H ₄ CF ₃ C(=CH ₂)C ₅ H ₄ N (Pyridine, 2-[1-[3-trifluoromethyl]phenyl]ethenyl)-)	XXXXXX-XX-X	**	9.02	EI	5570
	C ₆ H ₄ CF ₃ C(=CH ₂)C ₅ H ₄ N (Pyridine, 2-[1-[4-trifluoromethyl]phenyl]ethenyl)-)	XXXXXX-XX-X	**	8.97	EI	5570
C₄HN₂F₃⁺	C ₃ HF ₃ N ₂ (Pyrimidine, 2,4,6-trifluoro-)	696-82-2	**	10.93 (V)	PE	5530
C₈H₃NF₄⁺	C ₆ F ₄ C ₂ H ₂ NH (1 <i>H</i> -Indole, 4,5,6,7-tetrafluoro-)	16264-67-8	**	8.30±0.015 (V)	PE	5522

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_8H_2N_2F_4^+$	$C_8H_2N_2F_4$ (2,7-Naphthyridine, 1,3,6,8-tetrafluoro-)	56595-13-2	**	9.55 (V)	PE	4523
	$C_8H_2N_2(F)_4$ (Quinoxaline, 5,6,7,8-tetrafluoro-)	33319-19-6	**	9.50 (V)	PE	3959
$C_6H_2NF_5^+$	$C_6F_5NH_2$ (Benzenamine, 2,3,4,5,6-pentafluoro-)	771-60-8	**	8.40 ± 0.02	PE	3890
$C_9H_6N_3F_5^+$	$C_9F_5NC_3H_3N_2H_2$ (Imidazolidine,2-(pentafluorophenylimino)-)	XXXXX-XX-X	**	8.60 (V)	PE	5545
$C_3HNF_6^+$	$(CF_3)_2C=NH$	1645-75-6	**	11.8 (V)	PE	4814
$C_6H_7NF_6^+$	$(CH_3)_2NC(CF_3)=C(CF_3)H$	35186-00-6	**	8.22	PE	3589
$BC_4H_{12}N_2F^+$	$((CH_3)_2N)_2BF_2$	383-90-4	**	8.04	PE	3584
$BC_2H_6NF_2^+$	$(CH_3)_2NBF_2$	359-18-2	**	9.71	PE	3584
$B_2C_4H_{12}N_2F_2^+$	$(F(CH_3)BNCH_3)_2$	73775-17-1	**	9.34 (V)	PE	5628
$BC_6H_7NF_3^+$	$C_5H_4N(CF_3) \cdot BH_3$ (Pyridine, 4-trifluoromethyl)-, compound with borane (1:1))	56898-54-5	**	10.04 (V)	PE	4536
$B_3C_3H_9N_3F_3^+$	$C_3H_9B_3N_3F_3$ (Borazine, 2,4,6-trifluoro-1,3,5-trimethyl-)	13722-15-1	**	9.48 (V)	PE	3943
OF^+	FO	12061-70-0	**	12.77	PE	5425
			**	12.79 ± 0.1	OTH	3920
	OF_2	7783-41-7	F	≤ 14.438	PI	3920
OF_2^+	OF_2	7783-41-7	**	13.11 ± 0.01	PI	3920
	$(^2B_2)$		**	13.11	PE	3649
	$(^2B_1)$		**	13.26 (V)	PE	3694
	$(^2A_1)$		**	15.74	PE	3649
	$(^2B_2)$		**	16.17 (V)	PE	3694
	$(^2B_1)$		**	16.44 (V)	PE	3649
	$(^2A_2)$		**	16.47 (V)	PE	3694
	$(^2A_2)$		**	17.9	PE	3649
	$(^2B_2)$		**	20.7 (V)	PE	3649
HOF^+	HOF	14034-79-8	**	12.71 ± 0.01	PI	3932
	$(^2A'')$		**	12.69 ± 0.03	PE	3831
	$(^2A')$		**	14.50 ± 0.03	PE	3831
	$(^2A')$		**	15.9 ± 0.05	PE	3831
BOF^+	BOF	23361-56-0	**	14 ± 1	EI	4054

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
BOF₂⁺	BOF ₂	12006-82-5	**	17±1	EI	4054
COF⁺	CF ₂ O	353-50-4	F	14.85±0.2	PI	5041
COF₂⁺	CF ₂ O	353-50-4	**	13.02	PE	3649
			**	13.04	PE	3726
			**	13.6 (V)	PE	5041
			**	14.09	PE	3649
			**	19.15	PE	3649
			**	19.8 (V)	PE	3649
			**	21.1 (V)	PE	3649
			**	~22.7	PE	3649
C₂O₂F₂⁺	(COF) ₂	359-40-0	**	12.20±0.02	PE	4696
C₂OF₃⁺	(CF ₃) ₂ CO	684-16-2		11.65	EI	3550
COF₄⁺	CF ₃ OF	373-91-1	**	13.6 (V)	PE	3941
C₆O₂F₄⁺	C ₆ F ₄ O ₂ (2,5-Cyclohexadiene, 1,4-dione, 2,3,5,6-tetrafluoro-)	527-21-9	**	10.96±0.05 (V)	PE	5558
C₃OF₅⁺	(CF ₃) ₂ CO	684-16-2		16	EI	3550
C₃OF₆⁺	(CF ₃) ₂ CO	684-16-2	**	11.44	PE	3649
			**	12.09±0.02 (V)	PE	4524
CHOF⁺ (² A')	HFCO	1493-02-3	**	12.37±0.02	PE	4496
C₂H₃OF⁺	CH ₃ CFO	557-99-3	**	11.51±0.02	PE	4220
C₂H₅OF⁺	CH ₂ FCH ₂ OH	371-62-0	**	10.98 (V)	PE	5088
C₃H₅OF⁺	CH ₃ COCH ₂ F	430-51-3	**	10.20±0.02 (V)	PE	4524
	C ₂ H ₃ OCH ₂ F (Oxirane, (fluoromethyl)-)	503-09-3	**	10.78 (V)	PE	4747
C₃H₇OF⁺	CH ₂ FCH ₂ OCH ₃	627-43-0	**	10.18 (V)	PE	5088
C₆H₄OF⁺	C ₆ H ₄ FOCH ₃ (Benzene, 1-fluoro-3-methoxy-)	456-49-5	CH ₃	12.53±0.1	EI	3446
	C ₆ H ₄ FOCH ₃ (Benzene, 1-fluoro-4-methoxy-)	459-60-9	CH ₃	11.99±0.1	EI	3446
	C ₆ H ₄ FNO ₂ (Benzene, 1-fluoro-3-nitro-)	402-67-5	NO	10.25±0.1	EI	3447
	C ₆ H ₄ FNO ₂ (Benzene, 1-fluoro-4-nitro-)	350-46-9	NO	10.64±0.1	EI	3447

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₆H₃OF⁺	C ₆ H ₃ (F)(OH) (Phenol, 2-fluoro-)	367-12-4	**	8.95 (V)	PE	4891
	C ₆ H ₃ (F)(OH) (Phenol, 3-fluoro-)	372-20-3	**	8.97±0.02 (V)	PE	5184
	C ₆ H ₃ (F)(OH) (Phenol, 4-fluoro-)	371-41-5	**	8.99 (V)	PE	4891
	C ₆ H ₃ (F)(OH) (Phenol, 4-fluoro-)	371-41-5	**	9.05±0.02 (V)	PE	5184
	C ₆ H ₃ FOOCCH ₃ (Phenol, 2-fluoro-, acetate)	29650-44-0	CH ₂ =C=O	8.77 (V)	PE	4891
	C ₆ H ₃ FOOCCH ₃ (Phenol, 4-fluoro-, acetate)	405-51-6	CH ₂ =C=O	8.79±0.02 (V)	PE	5184
				9.17±0.03	EI	3483
				9.55±0.03	EI	3483
C₇H₃OF⁺	FC ₆ H ₄ COCH ₃ (Ethanone, 1-(4-fluorophenyl))	403-42-9	CH ₃	10.39±0.03	EI	5059
	C ₆ H ₃ (F)COOH (Benzoic acid, 3-fluoro-)	455-38-9	OH	12.50±0.2	EI	3973
	C ₆ H ₃ (F)COOH (Benzoic acid, 4-fluoro-)	456-22-4	OH	12.33±0.2	EI	3973
C₇H₃OF⁺	C ₆ H ₃ FOCH ₃ (Benzene, 1-fluoro-3-methoxy-)	456-49-5	**	8.70±0.1	EI	3446
	C ₆ H ₃ FOCH ₃ (Benzene, 1-fluoro-4-methoxy-)	459-60-9	**	8.58±0.1	EI	3446
C₈H₉OF⁺	C ₆ H ₅ OCH ₂ CH ₂ F (Benzene, 2-fluoroethoxy-)	405-97-0	**	8.63	EI	5083
C₇H₃O₂F⁺	C ₆ H ₃ (F)COOH (Benzoic acid, 3-fluoro-)	455-38-9	**	9.91±0.2	EI	3973
	C ₆ H ₃ (F)COOH (Benzoic acid, 4-fluoro-)	456-22-4	**	9.91±0.2	EI	3973
C₈H₇O₂F⁺	C ₆ H ₃ FOOCCH ₃ (Phenol, 2-fluoro-, acetate)	29650-44-0	**	8.78±0.03	EI	3483
	C ₆ H ₃ FOOCCH ₃ (Phenol, 4-fluoro-, acetate)	405-51-6	**	8.27±0.03	EI	3483
C₆H₃OF₂⁺	C ₆ H ₃ (OH)F ₂ (Phenol, 2,4-difluoro-)	367-27-1	**	8.98±0.02 (V)	PE	5184
	C ₆ H ₃ (OH)F ₂ (Phenol, 2,5-difluoro-)	XXXXXX-XX-X	**	9.10±0.02 (V)	PE	5184
	C ₆ H ₃ (OH)F ₂ (Phenol, 3,5-difluoro-)	XXXXXX-XX-X	**	9.04±0.02 (V)	PE	5184
	C ₆ H ₃ F ₂ OOCCH ₃ (Phenol, 2,4-difluoro-, acetate)	36914-77-9	CH ₂ =C=O	9.63±0.03	EI	3480
	C ₆ H ₃ F ₂ OOCCH ₃ (Phenol, 2,6-difluoro-, acetate)	36914-78-0	CH ₂ =C=O	9.69±0.03	EI	3480
C₈H₆O₂F₂⁺	C ₆ H ₃ F ₂ OOCCH ₃ (Phenol, 2,4-difluoro-, acetate)	36914-77-9	**	8.60±0.03	EI	3480
	C ₆ H ₃ F ₂ OOCCH ₃ (Phenol, 2,6-difluoro-, acetate)	36914-78-0	**	8.88±0.03	EI	3480

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_2H_3OF_3^+$	CF_3CH_2OH	75-89-8	**	11.7 (V)	PE	3941
$C_3H_3OF_3^+$	CH_3COCF_3	421-50-1	**	11.00 ± 0.02 (V)	PE	4524
$C_6H_3OF_3^+$	$C_6H_3(OH)F_3$ (Phenol,2,3,4-trifluoro-)	XXXXX-XX-X	**	9.19 ± 0.02 (V)	PE	5184
	$C_6H_3(OH)F_3$ (Phenol,2,4,5-trifluoro-)	XXXXX-XX-X	**	9.10 ± 0.02 (V)	PE	5184
$C_2HO_2F_3^+$	CF_3COOH	76-05-1	**	11.46	PE	3718
			**	12.00 ± 0.03 (V)	PE	3734
			**	12.00 (V)	PE	3874
			**	12.06 (V)	PE	5251
			**	12.08 ± 0.05 (V)	PE	4986
$C_3H_3O_2F_3^+$	$HCOOCH_2CF_3$	32042-38-9	**	11.31	PE	3718
$C_4H_5O_2F_3^+$	$CF_3COOC_2H_5$	383-63-1	**	11.6 (V)	PE	3718
	$CH_3COOCH_2CF_3$	406-95-1	**	10.84	PE	3718
$C_5H_5O_2F_3^+$	$CF_3COCH_2COCH_3$	367-57-7	**	9.92 ± 0.07 (V)	PE	3682
$C_6H_3O_2F_3^+$	$C_4H_3OCOCF_3$ (Ethanone, 2,2,2-trifluoro-1-(2-furanyl)-)	18207-47-1	**	9.77 ± 0.05	EI	3482
$C_8H_{11}O_2F_3^+$	$(CH_3)_3CCOCH_2COCF_3$	22767-90-4	**	9.87 ± 0.07 (V)	PE	3682
$C_3H_2OF_4^+$	$(CHF_2)_2CO$	360-52-1	**	11.33 ± 0.02 (V)	PE	4524
$C_6H_2OF_4^+$	$C_6H(OH)F_4$ (Phenol,2,3,5,6-tetrafluoro-)	769-39-1	**	9.40 ± 0.02 (V)	PE	5184
$C_3H_3OF_5^+$	$C_2F_5CH_2OH$	422-05-9	**	11.68 (V)	PE	3941
$C_6HOF_5^+$	C_6F_5OH (Phenol,pentafluoro-)	771-61-9	**	9.37 ± 0.02 (V)	PE	5184
			**	9.20 ± 0.02	PE	3890
$C_7H_3OF_5^+$	$C_6F_5OCH_3$ (Benzene, pentafluoromethoxy-)	389-40-2	**	9.10 ± 0.02	PE	3890
$C_3H_2OF_6^+$	$CF_3CH(OH)CF_3$	920-66-1	**	12.23 (V)	PE	3941
$C_5H_2O_2F_6^+$	$CF_3COCH_2COCF_3$	1522-22-1	**	10.74 ± 0.07 (V)	PE	3682

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₅HOF⁺₁₁	CF ₃ CF ₂ CF ₂ OCHF ₂ CF ₃	3330-15-2	**	12.6	PE	4424
C₈HO₂F⁺₁₇	F(CF(CF ₃)CF ₂ O) ₂ CHF ₂ CF ₃	3330-14-1	**	12.78 (V)	PE	4424
C₁₁HO₃F⁺₂₃	F(CF(CF ₃)CF ₂ O) ₃ CHF ₂ CF ₃	3330-16-3	**	12.96 (V)	PE	4424
C₁₄HO₄F⁺₂₉	F(CF(CF ₃)CF ₂ O) ₄ CHF ₂ CF ₃	26738-51-2	**	13.47 (V)	PE	4424
BeC₁₀H₂O₄F⁺₁₂	(CF ₃ COCHCOCF ₃) ₂ Be (Beryllium, bis(1,1,1,5,5,5-hexafluoro-2,4-pentanedionato- <i>O,O'</i>)-, (<i>T</i> -4)-)	19648-82-9	**	10.39±0.07 (V)	PE	3682
NOF⁺ (² A') (² A')	ONF	7789-25-5	** **	12.63±0.03 12.66	PE PE	4420 4404
NO₂F⁺	NO ₂ F	10022-50-1	**	13.09	PE	4404
NOF⁺₃	NOF ₃	13847-65-9	**	13.36±0.01	PE	3641
CNOF⁺₃	CF ₃ NO CF ₃ NO	XXXXX-XX-X 334-99-6	**	10.5±0.1 11.06±0.05 (V)	EI PE	5220 5298
C₂NOF⁺₆	(CF ₃) ₂ NO	2154-71-4	**	10.7±0.1 (V)	PE	3671
C₇H₆NOF⁺	C ₆ H ₄ (F)(CONH ₂) (Benzamide, 4-fluoro-)	824-75-9	**	9.50 (V)	PE	4918
C₈H₈NOF⁺	C ₆ H ₄ FNHCOCH ₃ (Acetamide, <i>N</i> -(2-fluorophenyl)-)	399-31-5	** **	8.65	EI	4834
	C ₆ H ₄ FNHCOCH ₃ (Acetamide, <i>N</i> -(4-fluorophenyl)-)	351-83-7	**	8.27±0.03 8.20±0.03	EI EI	3483 3483
C₁₂H₈NOF⁺	C ₆ H ₄ FCOC ₃ H ₄ N (Methanone, (2-fluorophenyl)-2-pyridinyl-)	XXXXX-XX-X	**	9.11	EI	5459
C₄H₃N₂OF⁺	C ₄ H ₃ N ₂ F(=O) (2(1H)-Pyrimidinone, 5-fluoro-)	2022-78-8	**	10.08±0.05	EI	5159
C₅H₃N₂OF⁺	C ₄ H ₂ N ₂ FOCH ₃ (Pyrimidine, 5-fluoro-2-methoxy-)	17148-49-1	**	9.65±0.05	EI	5159
	C ₄ H ₂ N ₂ F(=O)CH ₃ (2(1H)-Pyrimidinone, 5-fluoro-1-methyl-)	63331-05-5	**	9.21±0.05	EI	5159
C₇H₇N₂OF⁺	C ₆ H ₄ FNHCONH ₂ (Urea, (2-fluorophenyl)-)	656-31-5	**	8.50	EI	4834

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₆H₄NO₂F⁺	C ₆ H ₄ (F)(NO ₂) (Benzene, 1-fluoro-2-nitro-)	1493-27-2	**	9.86 (V)	PE	4892
	C ₆ H ₄ (F)(NO ₂) (Benzene, 1-fluoro-3-nitro-)	402-67-5	**	9.88	PE	4892
	C ₆ H ₄ (F)(NO ₂) (Benzene, 1-fluoro-4-nitro-)	350-46-9	**	9.93±0.1	EI	3447
			**	9.90	PE	4892
			**	10.00±0.1	EI	3447
C₁₂H₉N₄O₂F⁺	C ₁₀ H ₉ N ₄ (F)(=O) ₂ (CH ₃) ₂ (Benzo[<i>g</i>]pteridine-2,4(3H,10H)-dione, 3,10-dimethyl-7-fluoro-)	XXXXXX-XX-X	**	8.51 (V)	PE	4992
C₈H₇NOF₂⁺	C ₆ H ₃ F ₂ NHCOCH ₃ (Acetamide, <i>N</i> -(2,4-difluorophenyl)-)	399-36-0	**	8.21±0.03	EI	3480
	C ₆ H ₃ F ₂ NHCOCH ₃ (Acetamide, <i>N</i> -(2,6-difluorophenyl)-)	3896-29-5	**	8.52±0.03	EI	3480
C₆H₄NOF₃⁺	C ₄ H ₃ NCOCF ₃ (Ethanone, 2,2,2-trifluoro-1-(1 <i>H</i> -pyrrol-2-yl)-)	2557-70-2	**	9.18±0.05	EI	3482
	C ₅ H ₃ N(O)CF ₃ (Pyridine, 4-(trifluoromethyl)-1-oxide-)	XXXXXX-XX-X	**	8.90 (V)	PE	4536
C₈H₆NOF₃⁺	C ₆ H ₅ NHCO(CF ₃) (Acetamide, 2,2,2-trifluoro- <i>N</i> -phenyl-)	404-24-0	**	8.93±0.05 (V)	PE	5013
C₉H₈NOF₃⁺	C ₆ H ₃ (CH ₃)NHCO(CF ₃) (Acetamide, 2,2,2-trifluoro- <i>N</i> -(2-methylphenyl)-)	2727-68-6	**	8.84±0.05 (V)	PE	5013
	C ₆ H ₃ (CH ₃)NHCO(CF ₃) (Acetamide, 2,2,2-trifluoro- <i>N</i> -(3-methylphenyl)-)	2727-69-7	**	8.73±0.05 (V)	PE	5013
	C ₆ H ₃ (CH ₃)NHCO(CF ₃) (Acetamide, 2,2,2-trifluoro- <i>N</i> -(4-methylphenyl)-)	350-96-9	**	8.61±0.05 (V)	PE	5013
C₁₀H₁₀NOF₃⁺	C ₆ H ₃ (CH ₃) ₂ NHCO(CF ₃) (Acetamide, <i>N</i> -(2,3-dimethylphenyl)-2,2,2-trifluoro-)	14719-31-4	**	8.62±0.05 (V)	PE	5013
	C ₆ H ₃ (CH ₃) ₂ NHCO(CF ₃) (Acetamide, <i>N</i> -(3,4-dimethylphenyl)-2,2,2-trifluoro-)	XXXXXX-XX-X	**	8.51±0.05 (V)	PE	5013
	C ₆ H ₃ (CH ₃) ₂ NHCO(CF ₃) (Acetamide, <i>N</i> -(2,4-dimethylphenyl)-2,2,2-trifluoro-)	14618-47-4	**	8.56±0.05 (V)	PE	5013
	C ₆ H ₃ (CH ₃) ₂ NHCO(CF ₃) (Acetamide, <i>N</i> -(3,5-dimethylphenyl)-2,2,2-trifluoro-)	14818-53-2	**	8.59±0.05 (V)	PE	5013
	C ₆ H ₃ (CH ₃) ₂ NHCO(CF ₃) (Acetamide, <i>N</i> -(2,5-dimethylphenyl)-2,2,2-trifluoro-)	14618-48-5	**	8.70±0.05 (V)	PE	5013
	C ₆ H ₃ (CH ₃) ₂ NHCO(CF ₃) (Acetamide, <i>N</i> -(2,6-dimethylphenyl)-2,2,2-trifluoro-)	7497-27-0	**	8.99±0.05 (V)	PE	5013
C₅H₃N₂OF₃⁺	C ₅ H ₃ N ₂ OF ₃ (1 <i>H</i> -Imidazole, 1-(trifluoroacetyl)-)	1546-79-8	**	9.91 (V)	PE	5092
C₁₁H₁₆NO₂F₃⁺	C ₁₁ H ₁₆ NO ₂ F ₃ (2,4-Azetidinedione, 3,3-bis(1-methylethyl)-1-(2,2,2-trifluoroethyl)-)	56519-50-7	**	9.50	EI	4660
Ne⁺ (² P _{3/2})	Ne	7440-01-9	**	21.56471±0.00001 S		3754

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
Ne^+ (^2P) (^2P) (^2S) (^2S)	Ne	7440-01-9	** ** ** **	21.59 (V) 22.0 48.49 ± 0.01 (V) 49.0	PE PE PE PE	4970 4623 4970 4623
Ne^{+2}	Ne	7440-01-9	**	62.8 ± 0.2	EI	4503
Na^+	Na	7440-23-5	** ** ** **	5.2 5.3 ± 0.2 5.55 ± 0.2 5.6 ± 0.3	EI EI EI EI	4912 3609 5588 4518
	NaBO_2	XXXXX-XX-X	BO_2	9.66 ± 0.15	EI	4663
	NaF	7681-49-4	F	9.98 ± 0.15 ~ 12	EI EI	4663 3464
Na_2^+	Na_2	25681-79-2	** **	4.866 ± 0.014 4.9	PI EI	4914 4912
Na_3^+	Na_3	37279-42-8	**	3.97 ± 0.05	PI	4914
Na_4^+	Na_4	39297-86-4	**	4.27 ± 0.05	PI	4914
Na_5^+	Na_5	39297-87-5	**	4.05 ± 0.05	PI	4914
Na_6^+	Na_6	39297-88-6	**	4.12 ± 0.05	PI	4914
Na_7^+	Na_7	39297-89-7	**	4.04 ± 0.05	PI	4914
Na_8^+	Na_8	39297-90-0	**	4.10 ± 0.05	PI	4914
Na_9^+	Na_9	66457-73-6	**	4.0 ± 0.01	PI	4914
Na_{10}^+	Na_{10}	XXXXX-XX-X	**	3.9 ± 0.1	PI	4914
Na_{11}^+	Na_{11}	66457-74-7	**	3.8 ± 0.1	PI	4914
Na_{12}^+	Na_{12}	XXXXX-XX-X	**	3.6 ± 0.1	PI	4914
Na_{13}^+	Na_{13}	66457-75-8	**	3.6 ± 0.1	PI	4914
Na_{14}^+	Na_{14}	66457-76-9	**	3.5 ± 0.1	PI	4914
LiNa^+	NaLi	12333-49-2	**	4.94 ± 0.10	EI	4912

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
ONa⁺	NaO	12401-86-4	**	12.9	EI	4518
BO₂Na⁺	NaBO ₂	XXXXX-XX-X	**	9.18±0.10	EI	4663
BO₂Na₂⁺	(NaBO ₂) ₂	XXXXX-XX-X	BO ₂	10.15±0.12	EI	4663
	Na ₂ BO ₂ F	XXXXX-XX-X	F ⁻	6.18±0.10	EI	4663
	Na ₂ BO ₂ F	XXXXX-XX-X	F	10.15±0.12	EI	4663
FNa₂⁺	Na ₂ F ₂	12285-64-2	F ⁻	5.86±0.10	EI	4663
			F	10.00±0.10	EI	4663
	Na ₂ BO ₂ F	XXXXX-XX-X	BO ₂ ⁻	5.86±0.10	EI	4663
	Na ₂ BO ₂ F	XXXXX-XX-X	BO ₂	10.00±0.10	EI	4663
Mg⁺	Mg	7439-95-4	**	7.63±0.08	EI	4114
			**	7.72±0.05	EI	5342
	(C ₅ H ₅) ₂ Mg (Magnesium, bis(η ⁵ -2,4-cyclopentadien-1-yl)-)	1284-72-6		13.9±0.5	EI	3793
C₅H₅Mg⁺	(C ₅ H ₅) ₂ Mg (Magnesium, bis(η ⁵ -2,4-cyclopentadien-1-yl)-)	1284-72-6		11.0±0.2	EI	3793
C₁₀H₁₀Mg⁺	(C ₅ H ₅) ₂ Mg (Magnesium, bis(η ⁵ -2,4-cyclopentadien-1-yl)-)	1284-72-6	**	8.11 (V)	PE	3688
			**	8.0±0.1	EI	3793
C₁₂H₁₄Mg⁺	(C ₅ H ₄ CH ₃) ₂ Mg (Magnesocene, 1,1'-dimethyl-)	40672-08-0	**	7.78 (V)	PE	3688
C₃₆H₄₄N₄Mg⁺	((C ₂ H ₅) ₂ C ₄ NCH) ₄ Mg (Magnesium, [2,3,7,8,12,13,17,18-octaethyl-21H,23H-porphinato(2-)-N ²¹ ,N ²² ,N ²³ ,N ²⁴]-[SP-4-1]-)	20910-35-4	**	6.19±0.03 (V)	PE	5476
C₄₄H₂₈N₄Mg⁺	C ₂₀ H ₈ N ₄ (C ₆ H ₅) ₄ Mg (Magnesium, [5,10,15,20-tetraphenyl-21H,23H-porphinato(2-)-N ²¹ ,N ²² ,N ²³ ,N ²⁴]-[SP-4-1]-)	14640-21-2	**	5.91±0.2	OTH	4962
			**	6.48 (V)	PE	4557
C₁₀H₁₄O₄Mg⁺	(CH ₃ COCHCOCH ₃) ₂ Mg (Magnesium, bis(2,4-pentanedionato-O,O')-(T-4)-)	14024-56-7	**	8.42 (V)	PE	4384
C₅₅H₇₂N₄O₅Mg⁺	C ₃₄ H ₃₃ N ₄ O ₃ MgCOOC ₂₀ H ₃₉ (Chlorophyll a)	42617-16-3	**	6.1±0.2	OTH	5278
C₁₀H₂O₄F₁₂Mg⁺	(CF ₃ COCHCOCF ₃) ₂ Mg (Magnesium, bis(1,1,1,5,5,5 hexafluoro-2,4-pentanedionato-O,O')-(T-4)-)	19648-85-2	**	10.28 (V)	PE	4384
Al⁺	Al	7429-90-5	**	6.0±0.3	PE	4860

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
Al^+	Al	7429-90-5	** ** ** ** **	6.0 ± 0.2 6.0 ± 0.3 6.0 ± 1 6.0 6.6 ± 0.6	EI EI EI EI EI	5171 5067 4687 4872 3440
Al^{2+}	Al^+	14903-36-7	**	18.82873 ± 0.0001	S	5081
Al_2^+	Al_2	32752-94-6	** **	5.4 ± 1.0 5.4 ± 1.0	EI EI	4005 4014
	Al_2O	12004-36-3		15.2 ± 0.5	EI	4005
$\text{H}_{12}\text{B}_3\text{Al}^+$	$\text{Al}(\text{BH}_4)_3$	13771-22-7	** **	12.9 ± 0.1 (V) 12.9 (V)	PE PE	4825 4888
C_2Al^+	AlC_2	37297-57-7	**	9.3 ± 1.0	EI	4014
C_2Al_2^+	Al_2C_2	12122-01-9	**	8.0 ± 0.5	EI	4014
$\text{C}_3\text{H}_9\text{Al}^+$	$(\text{CH}_3)_3\text{Al}$	75-24-1	**	9.76 (V)	PE	4398
$\text{C}_{18}\text{H}_{15}\text{Al}^+$	$(\text{C}_6\text{H}_5)_3\text{Al}$ (Aluminum, triphenyl-)	841-76-9	**	8.53 ± 0.03	PI	4055
OAl^+	AlO	14457-64-8	** ** ** ** ** ** ** **	9.5 ± 0.2 9.5 ± 1 9.5 9.53 ± 0.15 9.9 ± 0.5 10.3 ± 1 9 ± 1 10 ± 1	EI EI EI EI EI EI EI EI	5171 3617 4872 3816 4678 4687 3463 3620
	Al_2O	12004-36-3		15.1 ± 0.3	EI	4005
O_2Al^+	AlO_2	11092-32-3	** ** **	10.5 ± 1.0 10 ± 1 10 ± 1	EI EI EI	5171 3463 3617
OAl_2^+	Al_2O	12004-36-3	** ** ** ** ** ** ** **	7.7 ± 0.2 7.7 ± 0.5 8.0 ± 0.5 8.1 ± 1 8.20 ± 0.15 8.5 ± 0.2 8.5 ± 1 9 ± 1	EI EI EI EI EI EI EI EI	4005 3985 4678 4687 3816 5171 3617 3620
O_2Al_2^+	Al_2O_2	12252-63-0	** ** **	9.9 ± 0.5 10.0 ± 1 10 ± 1	EI EI EI	5171 4687 3617

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
FAI⁺	AlF	13595-82-9	**	9.86±0.05	S	4229
			**	9	EI	3606
F₂Al⁺	AlF ₂	13569-23-8	**	10	EI	3606
OFAI⁺	AlOF	13596-12-8	**	10.5±1	EI	3462
			**	11	EI	3606
OF₂Al⁺	AlOF ₂	38344-66-0	**	13±1	EI	3606
C₁₃H₁₂O₆F₉Al⁺	(CF ₃ COCHCOCH ₃) ₃ Al (Aluminum, tris(1,1,1-trifluoro-2,4-pentanedionato- <i>O,O'</i>)-)	14354-59-7	**	9.22±0.07 (V)	PE	3682
C₁₃H₃O₆F₁₈Al⁺	(CF ₃ COCHCOCF ₃) ₃ Al (Aluminum, tris(1,1,1,5,5,5-hexafluoro-2,4-pentanedionato- <i>O,O'</i>)-, (<i>OC</i> -6-11)-)	15306-18-0	**	10.33±0.07 (V)	PE	3682
Si⁺	Si	7440-21-3	**	8.15172±0.00003	S	4582
			**	8.1±0.5	EI	3969
			**	8.2±0.5	EI	4200
			**	8.5±0.5	EI	3610
	SiH ₄	7803-62-5		13.3	EI	3813
	CH ₃ SiH ₃	992-94-9		12.1	EI	4625
	CH ₃ SiD ₃	1066-43-9		11.8	EI	4625
HSi⁺ (¹ Σ ⁺)	SiH	13774-94-2	**	7.91	OTH	3564
	SiH ₄	7803-62-5		14.7	EI	3813
	CH ₃ SiH ₃	992-94-9		14.8	EI	4625
H₂Si⁺	SiH ₄	7803-62-5	H ₂	11.8	EI	3813
			H ₂	11.9±0.1	EI	5276
			2H?	16.2	EI	3813
	Si ₂ H ₆	1590-87-0	SiH ₄	11.95±0.1	EI	5276
	CH ₃ SiH ₃	992-94-9	CH ₄	11.5±0.1	EI	5276
				11.7	EI	4625
D₂Si⁺	CH ₃ SiD ₃	1066-43-9		11.6	EI	4625
H₃Si⁺	SiH ₄	7803-62-5	H	12.2	EI	3813
			H	12.3±0.1	EI	5276
	Si ₂ H ₆	1590-87-0	SiH ₃	11.75±0.1	EI	5276
	CH ₃ SiH ₃	992-94-9		12.5	EI	4625
D₃Si⁺	CH ₃ SiD ₃	1066-43-9		12.4	EI	4625
H₄Si⁺	SiH ₄	7803-62-5	**	12.3 (V)	PE	4972
			**	11.60	PE	3716
			**	11.7	PE	5276

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
H_3Si_2^+	Si_2H_6	1590-87-0	H	11.4 ± 0.1	EI	5276
H_6Si_2^+	Si_2H_6	1590-87-0	**	10.0	PE	5276
			**	10.53 (V)	PE	4160
			**	10.53 (V)	PE	4558
H_8Si_3^+	Si_3H_8	7783-26-8	**	9.87 (V)	PE	4558
$\text{H}_{10}\text{Si}_4^+$	$n\text{-Si}_4\text{H}_{10}$	7783-29-1	**	9.62 (V)	PE	4558
$\text{H}_{12}\text{Si}_5^+$	$n\text{-Si}_5\text{H}_{12}$	14868-53-2	**	9.36 (V)	PE	4558
$\text{H}_{11}\text{B}_5\text{Si}^+$	$\text{B}_5\text{H}_8(\text{SiH}_3)$ (Pentaborane(9), 2,3- μ -silyl-)	22044-27-5	**	10.17 (V)	PE	4519
$\text{H}_{11}\text{B}_5\text{Si}^+$	$\text{B}_5\text{H}_8(\text{SiH}_3)$ (Pentaborane(9), 1-silyl-)	28556-29-8	**	10.40 (V)	PE	4519
	$\text{B}_5\text{H}_8(\text{SiH}_3)$ (Pentaborane(9), 2-silyl-)	22142-52-5	**	10.42 (V)	PE	4519
C_2Si^+	SiC_2	12071-27-1	**	10.1 ± 0.5	EI	4005
			**	10.3 ± 0.5	EI	3969
CSi_2^+	Si_2C	XXXXXX-XX-X	**	9.0 ± 0.5	EI	4005
	Si_2C	XXXXXX-XX-X	**	9.5 ± 0.5	EI	3969
CH_3Si^+	CH_3SiH_3	992-94-9		12.8	EI	4625
	CH_3SiD_3	1066-43-9		12.1	EI	4625
	$\text{CH}_2=\text{CHSi}(\text{CH}_3)_2$	754-05-2		15	EI	3809
CH_2DSi^+	CH_3SiD_3	1066-43-9		11.4	EI	4625
CH_3Si^+	CH_3SiH_3	992-94-9		11.3	EI	4625
	$(\text{CH}_3)_2\text{SiH}_2$	1111-74-6	H_2	11.4 ± 0.1	EI	5276
			CH_4	11.1 ± 0.1	EI	5276
CH_3DSi^+	CH_3SiD_3	1066-43-9	2D	11.5	EI	4625
$\text{CH}_2\text{D}_2\text{Si}^+$	CH_3SiD_3	1066-43-9	H,D	11.4	EI	4625
CH_5Si^+	CH_3SiH_3	992-94-9	H	11.8 ± 0.1	EI	5276
			H	11.8	EI	4625
	$(\text{CH}_3)_2\text{SiH}_2$	1111-74-6	CH_4	11.5 ± 0.1	EI	5276
	$\text{CH}_2=\text{CHSi}(\text{CH}_3)_2$	754-05-2		15	EI	3809
	$((\text{CH}_3)_2\text{H}_2\text{Si})_2$	870-26-8	CH_3SiH_2	11.4 ± 0.1	EI	5276

Table of Ion Energetics Measurements—Continued

Ion	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
CH₃D₂Si⁺	CH ₃ SiD ₃	1066-43-9	D	11.8	EI	4625
CH₆Si⁺	CH ₃ SiH ₃	992-94-9	**	10.7	PE	5276
			**	11.6 (V)	PE	4972
C₂H₄Si⁺	CH≡CSiH ₃	1066-27-9	**	10.73 (V)	PE	4160
C₂H₆Si⁺	CH ₂ =CHSiH ₃	7291-09-0	**	10.37 (V)	PE	3950
			**	10.4 (V)	PE	3940
	(CH ₃) ₂ SiH ₂	1111-74-6	H ₂	10.7±0.1	EI	5276
	(CH ₃) ₃ SiH	993-07-7	CH ₄	10.5±0.1	EI	5276
	(CH ₃) ₂ HSiSiH ₂ CH ₃	814-74-4	CH ₃ SiH ₃	10.75±0.1	EI	5276
	((CH ₃) ₂ HSi) ₂	814-98-2	(CH ₃) ₂ SiH ₂	10.7±0.1	EI	5276
C₂H₇Si⁺	(CH ₃) ₂ SiH ₂	1111-74-6	H	11.1±0.1	EI	5276
	(CH ₃) ₃ SiH	993-07-7	CH ₃	10.9±0.1	EI	5276
	CH ₂ =CHSi(CH ₃) ₃	754-05-2		13	EI	3809
	((CH ₃) ₂ HSi) ₂	870-26-8	SiH ₄	10.3±0.1	EI	5276
	(CH ₃) ₂ HSiSiH ₂ CH ₃	814-74-4	CH ₃ SiH ₂	10.75±0.1	EI	5276
	((CH ₃) ₂ HSi) ₂	814-98-2	(CH ₃) ₂ SiH	10.8±0.1	EI	5276
C₂H₈Si⁺	(CH ₃) ₂ SiH ₂	1111-74-6	**	10.3	PE	5276
			**	11.2 (V)	PE	4972
C₃H₆Si⁺	(CH ₃) ₂ Si=CH ₂	4112-23-6	**	7.5±0.3	OTH	5287
	CH ₂ =CHCH ₂ SiH ₃	18191-59-8	**	9.49 (V)	PE	3950
	C ₃ H ₆ Si (Silacyclobutane)	287-29-6	**	10.05 (V)	PE	4077
	CH ₂ =CHSi(CH ₃) ₃	754-05-2	C ₂ H ₄	10	EI	3809
	C ₃ H ₆ Si(CH ₃) ₂	2295-12-7	C ₂ H ₄	9.61	PI	5287
	(Silacyclobutane, 1,1-dimethyl-)					
C₃H₉Si⁺	(CH ₃) ₃ SiH	993-07-7	H	10.5±0.1	EI	5276
	(CH ₃) ₄ Si	75-76-3	CH ₃	10.03±0.04	PI	4907
			CH ₃	10.25±0.1	EI	5276
			CH ₃	10.53±0.20	EI	3548
			CH ₃	10.63±0.05	EI	4126
	CH ₂ =CHSi(CH ₃) ₃	754-05-2	C ₂ H ₄	11	EI	3809
	(CH ₃) ₃ SiC ₂ H ₅	3439-38-1	C ₂ H ₅	10.0±0.1	EI	5276
	(CH ₃) ₂ HSiSiH ₂ CH ₃	814-74-4	SiH ₃	9.8±0.1	EI	5276
	(CH ₃) ₃ SiSiH ₃	18365-32-7	SiH ₃	9.7±0.1	EI	5276
	((CH ₃) ₂ HSi) ₂	814-98-2	CH ₃ SiH ₂	10.1±0.1	EI	5276
	(CH ₃) ₃ SiSiH(CH ₃) ₂	812-15-7	(CH ₃) ₂ SiH	10.0	EI	5276
			(CH ₃) ₂ SiH	10.2±0.1	EI	5276
	(CH ₃) ₃ Si ₂	1450-14-2	(CH ₃) ₃ Si	9.9	EI	5276
	(CH ₃) ₄ Si ₂	1450-14-2	(CH ₃) ₃ Si	10.22±0.18	EI	3548
	C ₆ H ₅ Si ₂ (CH ₃) ₅	1130-17-2	C ₆ H ₅ Si(CH ₃) ₂	10.08±0.09	EI	3549
	(Disilane, pentamethylphenyl-)					
	(C ₆ H ₅) ₂ SiCH ₃ Si(CH ₃) ₃	1450-16-4		10.59±0.03	EI	3549
	(Disilane, 1,1,1,2-tetramethyl-2,2-diphenyl-)					
	(C ₆ H ₅ (CH ₃) ₂ Si) ₂	1145-98-8	(C ₆ H ₅) ₂ SiCH ₃	11.04±0.03	EI	3549
	(Disilane, 1,1,2,2-tetramethyl-1,2-diphenyl-)					
	(C ₆ H ₅) ₃ SiSi(CH ₃) ₃	1450-18-6	(C ₆ H ₅) ₃ Si	10.83±0.09	EI	3549
	(Disilane, 1,1,1-trimethyl-2,2,2-triphenyl-)					

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_3H_9Si^+$	$(CH_3)_2NCH_2Si(CH_3)_3$	18182-40-6	C_3H_8N	9.76	PI	5543
	$(CH_3)_3SiOSi(CH_3)_3$	107-46-0		15.4 ± 0.2	EI	3444
	$(CH_3)_3SiOSi(CH_3)_2OSi(CH_3)_3$	107-51-7		15.8 ± 0.2	EI	3444
	$(CH_3)_3SiOSi(CH_3)(C_2H_5)OSi(CH_3)_3$	5356-85-4		15.4 ± 0.2	EI	3444
	$(CH_3)_3SiOSi(CH_3)(C_2H_5)OSi(CH_3)_2$	17861-60-8		15.3 ± 0.2	EI	3444
	$C_6H_5SSi(CH_3)_3$	4551-15-9		10.18 ± 0.1	EI	4198
	(Silane, trimethyl(phenylthio)-)					
	$(CH_3)_3SiCl$	30687-62-8	Cl	11.6 ± 0.1	EI	5276
	$((CH_3)_3Si)(CO)_5Mn$	26500-16-3		9.81 ± 0.11	EI	5321
	$(CH_3)_3SiGe(CH_3)_3$	31608-80-7	$(CH_3)_3Ge$	10.19 ± 0.12	EI	3548
	$((CH_3)_3Si)(CH_3)_3Sn$	16393-88-7	$(CH_3)_3Sn$	10.18 ± 0.26	EI	3548
$C_3H_{10}Si^+$	$(CH_3)_3SiH$	993-07-7	**	9.9	PE	5276
			**	10.8 (V)	PE	4972
$C_4H_7Si^+$	$(CH_3)_3SiC \equiv CH$	1066-54-2	CH_3	10.79 ± 0.04	EI	4126
$C_4H_8Si^+$	C_4H_8Si	XXXXX-XX-X	**	9.21 (V)	PE	4517
	(Silacyclopent-3-ene)					
$C_5H_9Si^+$	$CH_2 = CHSi(CH_3)_3$	754-05-2	CH_3	.9	EI	3809
$C_7H_{10}Si^+$	$(C_2H_5)_2SiH_2$	542-91-6	H_2	10.0 ± 0.1	EI	5276
	$(C_2H_5)_3SiH$	617-86-7	C_2H_6	9.75 ± 0.1	EI	5276
$C_3H_{12}Si^+$	$(CH_3)_4Si$	75-76-3	**	9.80 ± 0.03	PI	4907
			**	9.42 ± 0.1	PE	3677
			**	9.6	PE	5276
			**	9.79 ± 0.04	PE	3880
			**	10.4 (V)	PE	4972
			**	10.57 (V)	PE	5368
			**	15.62 (V)	PE	3503
			**	9.85 ± 0.16	EI	3548
			**	9.99 ± 0.03	EI	4126
			**	9.8	PE	5276
	$(C_2H_5)_2SiH_2$	542-91-6	**	9.8	PE	5276
			**	10.3 (V)	PE	4972
$C_3H_5Si^+$	$(CH_3)_2Si(C \equiv CH)_2$	1675-60-1	CH_3	12.05 ± 0.05	EI	4126
$C_3H_6Si^+$	C_3H_6SiH (Silabenzene)	289-77-0	**	8.0 (V)	PE	5107
$C_5H_8Si^+$	$C_5H_8(SiH_3)$	33618-25-6	**	8.7 (V)	PE	4373
	(Silane, 2,4-cyclopentadien-1-yl-)					
$C_3H_{10}Si^+$	$(CH_3)_3SiC \equiv CH$	1066-54-2	**	9.9 ± 0.1	PE	4002
			**	10.40 ± 0.02	EI	4126
$C_3H_{12}Si^+$	$(CH_3)_3SiCH = CH_2$	754-05-2	**	9.8 (V)	PE	3908

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_3H_{12}Si^+$	$(CH_3)_3SiCH=CH_2$	754-05-2	** **	9.8 (V)	PE	3940
	$C_3H_6Si(CH_3)_2$ (Silacyclobutane, 1,1-dimethyl-)	2295-12-7	**	9.2 9.40 (V)	EI PE	3809 4077
$C_3H_{11}Si^+$	$(CH_3)_3SiC_2H_5$	3439-38-1	**	9.6	PE	5276
$C_6H_3Si^+$	$CH_3Si(C\equiv CH)_3$	1849-39-4	CH_4	12.81 ± 0.07	EI	4126
$C_6H_8Si^+$	$(CH_3)_2Si(C\equiv CH)_2$	1675-60-1	**	10.85 ± 0.10	EI	4126
	$C_5H_5SiCH_3$ (Silabenzene, 1-methyl-)	63878-65-9	**	7.7 (V)	PE	5216
	$C_6H_5SiH_3$ (Silane, phenyl-)	694-53-1	**	9.09	PE	3868
			**	9.25	PE	3922
$C_6H_{12}Si^+$	$(C_2H_5)_2Si(CH_3)_2$	10519-87-6	** **	9.8 (V) 9.8 (V)	PE PE	3994 5089
	$C_6H_{12}Si$ (Silacyclopent-2-ene, 1,1-dimethyl-)	18187-50-3	**	9.27 ± 0.03 (V)	PE	5389
	$C_4H_6Si(CH_3)_2$ (Silacyclopent-3-ene, 1,1-dimethyl-)	16054-12-9	**	9.0 (V)	PE	5550
			**	9.1 ± 0.03 (V)	PE	5389
$C_6H_{14}Si^+$	$(CH_3)_3SiCH_2CH=CH_2$	762-72-1	** **	9.0 (V) 9.0 (V)	PE PE	3908 3940
	$C_5H_5Si(CH_3)_3$ (Silacyclobutane, 1,1,2-trimethyl-)	30681-90-4	**	9.20 (V)	PE	4077
	$C_4H_8Si(CH_3)_2$ (Silacyclopentane, 1,1-dimethyl-)	1072-54-4	**	9.75 (V)	PE	4077
$C_6H_{13}Si^+$	$(C_2H_5)_3SiH$	617-86-7	H	10.4 ± 0.1	EI	5276
	$(C_2H_5)_4Si$	631-36-7	C_2H_5	10.0 ± 0.1	EI	5276
$C_6H_{16}Si^+$	$(C_2H_5)_3SiH$	617-86-7	**	9.5	PE	5276
			**	9.9 (V)	PE	4985
			**	10.0 (V)	PE	4972
$C_7H_6Si^+$	$CH_3Si(C\equiv CH)_3$	1849-39-4	**	11.06 ± 0.03	EI	4126
$C_7H_9Si^+$	$C_6H_5SiH(CH_3)_2$ (Silane, dimethylphenyl-)	766-77-8	CH_3	8.72	EI	4125
$C_8H_4Si^+$	$Si(C\equiv CH)_4$	1849-38-3	**	11.34	EI	4126
$C_8H_{11}Si^+$	$C_6H_5Si(CH_3)_2H$ (Silane, dimethylphenyl-)	766-77-8	H	10.43 ± 0.04	EI	3549
	$C_6H_4(CH_3)SiH(CH_3)_2$ (Silane, dimethyl(4-methylphenyl)-)	1432-39-9	CH_3	8.34	EI	4125
	$C_6H_5Si(CH_3)_3$ (Silane, trimethylphenyl-)	768-32-1	CH_3	10.26 ± 0.03	EI	3549

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_8H_{11}Si^+$	$C_6H_5Si_2(CH_3)_5$ (Disilane, pentamethylphenyl-)	1130-17-2	$Si(CH_3)_3$	9.86 ± 0.06	EI	3549
	$(C_6H_5)_2SiCH_3Si(CH_3)_3$ (Disilane, 1,1,1,2-tetramethyl-2,2-diphenyl-)	1450-16-4	$C_6H_5Si(CH_3)_2$	9.75 ± 0.04	EI	3549
	$(C_6H_5)(CH_3)_2Si_2$ (Disilane, 1,1,2,2-tetramethyl-1,2-diphenyl-)	1145-98-8	$C_6H_5Si(CH_3)_2$	9.87 ± 0.08	EI	3549
	$(C_6H_5)_3SiSi(CH_3)_3$ (Disilane, 1,1,1-trimethyl-2,2,2-triphenyl-)	1450-18-6	$(C_6H_5)_2SiCH_3$	10.13 ± 0.03	EI	3549
$C_8H_{12}Si^+$	$(C_2H_5)_3Si$	1112-55-6	**	9.7 (V)	PE	3994
	$C_6H_5Si(CH_3)_2H$ (Silane, dimethylphenyl-)	766-77-8	**	8.92 ± 0.15	EI	3549
$C_8H_{11}Si^+$						
	$C_3H_5(Si(CH_3)_2)_2$ (Silane, 2,4-cyclopentadien-1-yltrimethyl-)	3559-74-8	**	8.30 (V)	PE	5535
$C_8H_{20}Si^+$						
	$(C_2H_5)_3Si$	631-36-7	**	8.9	PE	5276
			**	9.8 (V)	PE	4985
$C_9H_{11}Si^+$						
	$C_6H_5Si(CH_3)_3$ (Silane, trimethylphenyl-)	768-32-1	**	9.0 (V)	PE	5380
			**	9.05 (V)	PE	4280
			**	8.81 ± 0.15	EI	3549
			**	8.79	CTS	3922
$C_9H_{22}Si^+$						
	$(iso-C_3H_7)_3SiH$	6485-79-6	**	9.5 (V)	PE	4985
$C_{10}H_{10}Si^+$						
	$C_{10}H_7SiH_3$ (Silane, 1-naphthalenyl-)	38274-75-8	**	8.12	CTS	3922
$C_{10}H_{11}Si^+$						
	$C_9H_8Si(CH_3)_2$ (1-Silaindan, 1,1-dimethyl-)	17158-48-4	**	8.54	CTS	3546
	$C_9H_8Si(CH_3)_2$ (1H-2-Silaindene, 2,3-dihydro-2,2-dimethyl-)	2764-87-6	**	8.41	CTS	3546
$C_{10}H_{16}Si^+$						
	$C_6H_5CH_2Si(CH_3)_3$ (Silane, trimethyl(phenylmethyl))	770-09-2	**	8.35	PE	5574
			**	8.4	PE	4589
			**	8.42 (V)	PE	4280
			**	8.27	CTS	3922
			**	8.37	CTS	3546
$C_{11}H_{16}Si^+$						
	$C_6H_5CH=CHSi(CH_3)_3$ (Silane, trimethyl(2-phenylethenyl)-, (E)-)	19372-00-0	**	7.89 ± 0.04	EI	4097
	$C_6H_5CH=CHSi(CH_3)_3$ (Silane, trimethyl(2-phenylethenyl)-, (Z)-)	19319-11-0	**	8.19 ± 0.04	EI	4097
	$C_6H_5C(Si(CH_3)_3)=CH_2$ (Silane, trimethyl(1-phenylethenyl)-)	1923-01-9	**	8.23 ± 0.04	EI	4097
$C_{12}H_{12}Si^+$						
	$(C_6H_5)_2SiH_2$ (Silane, diphenyl-)	775-12-2	**	9.23 ± 0.05 (V)	PE	4620

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{12}H_{16}Si^+$	$C_6H_7Si(CH_3)_3$ (Silane, 1 <i>H</i> -inden-1-yltrimethyl-)	18053-75-3	**	7.65 ± 0.01	EI	3805
	$C_6H_7Si(CH_3)_3$ (Silane, (2,3-dihydro-1 <i>H</i> -inden-1-yl)trimethyl-)	18036-88-9	**	7.87 ± 0.01	EI	3805
$C_{12}H_{18}Si^+$	$C_6H_5CH=CHCH_2Si(CH_3)_3$ (Silane, trimethyl(3-phenyl-2-propenyl)-, (E)-)	40595-34-4	**	8.13	CTS	3546
	$C_6H_5CH=CHCH_2Si(CH_3)_3$ (Silane, trimethyl(3-phenyl-2-propenyl)-, (Z)-)	40595-35-5	**	7.61 ± 0.04	EI	4097
	$C_6H_5CH=CHCH_2Si(CH_3)_3$ (Silane, trimethyl(3-phenyl-2-propenyl)-, (Z)-)	40595-35-5	**	7.77 ± 0.04	EI	4097
$C_{13}H_{13}Si^+$	$(C_6H_5)_2Si(CH_3)H$ (Silane, methyldiphenyl-)	776-76-1	H	10.97 ± 0.12	EI	3549
	$(C_6H_5)_2SiCH_3Si(CH_3)_3$ (Disilane, 1,1,1,2-tetramethyl-2,2-diphenyl-)	1450-16-4	$(CH_3)_3Si$	9.63 ± 0.02	EI	3549
	$(C_6H_5)_2Si(CH_3)_2$ (Disilane, 1,1,2,2-tetramethyl-1,2-diphenyl-)	1145-98-8	$(CH_3)_3Si$	9.60 ± 0.02	EI	3549
	$((C_6H_5)_2CH_2Si)_2$ (Disilane, 1,2-dimethyl-1,1,2,2-tetraphenyl-)	1172-76-5	$(C_6H_5)_2SiCH_3$	9.51 ± 0.05	EI	3549
	$(C_6H_5)_2Si(CH_3)H$ (Silane, methyldiphenyl-)	776-76-1	**	8.75 ± 0.15	EI	3549
$C_{13}H_{16}Si^+$	$C_{10}H_7Si(CH_3)_3$ (Silane, trimethyl-1-naphthalenyl-)	18052-80-7	**	8.03	CTS	3758
	$C_{12}H_8Si(CH_3)_2$ (5 <i>H</i> -Dibenzosilole, 5,5-dimethyl-)	13688-68-1	**	7.9 (V)	PE	4081
$C_{14}H_{18}Si^+$	$C_{10}H_7CH_2Si(CH_3)_3$ (Silane, trimethyl(1-naphthalenylmethyl)-)	18410-58-7	**	7.83	CTS	3758
			**	7.83	CTS	3922
$C_{17}H_{18}Si^+$	$C_6H_7Si(CH_3)_2C_6H_5$ (Silane, 1 <i>H</i> -inden-1-yl dimethylphenyl-)	27490-90-0	**	7.69 ± 0.04	EI	3805
	$C_9H_9Si(CH_3)_2C_6H_5$ (Silane, (2,3-dihydro-1 <i>H</i> -inden-1-yl)dimethylphenyl-)	41273-54-5	**	7.94 ± 0.01	EI	3805
$C_{18}H_{15}Si^+$	$(C_6H_5)_3SiH$ (Silane, triphenyl-)	789-25-3	H	9.58 ± 0.08	EI	3549
	$(C_6H_5)_4Si$ (Silane, tetraphenyl-)	1048-08-4	C_6H_5	9.7	PI	4055
	$(C_6H_5)_3SiSi(CH_3)_3$ (Disilane, 1,1,1-trimethyl-2,2,2-triphenyl-)	1450-18-6	C_6H_5	9.93 ± 0.08	EI	3549
	$((C_6H_5)_2CH_2Si)_2$ (Disilane, 1,2-dimethyl-1,1,2,2-tetraphenyl-)	1172-76-5	$(CH_3)_3Si$	9.35 ± 0.03	EI	3549
	$((C_6H_5)_2CH_2Si)_2$ (Disilane, 1,2-dimethyl-1,1,2,2-tetraphenyl-)	1172-76-5	$C_6H_5Si(CH_3)_2$	9.35 ± 0.03	EI	3549
	$((C_6H_5)_3Si)_2$ (Disilane, hexaphenyl-)	1450-23-3	$(C_6H_5)_3Si$	9.61 ± 0.09	EI	3549

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{10}H_{16}Si^+$	$(C_6H_5)_3SiH$ (Silane, triphenyl-)	789-25-3	**	9.13 ± 0.05 (V)	PE	4620
			**	8.80 ± 0.15	EI	3549
$C_{22}H_{20}Si^+$	$C_{10}H_7Si(CH_3)_2C_{10}H_7$ (Silane, dimethyl-di-1-naphthalenyl-)	18753-19-0	**	8.03	CTS	3758
$C_{24}H_{16}Si^+$	$C_{24}H_{16}Si$ (5,5'-Spirobi[5 <i>H</i> -dibenzosilole])	159-68-2	**	7.85 (V)	PE	4081
$C_{24}H_{20}Si^+$	$(C_6H_5)_4Si$ (Silane, tetraphenyl-)	1048-08-4	**	8.50 ± 0.03	PI	4055
			**	8.65 ± 0.15	EI	3549
$C_2H_6Si_2^+$	$SiH_3C \equiv CSiH_3$	XXXXX-XX-X	**	10.46 (V)	PE	4160
$C_6H_{18}Si_2^+$	$(CH_3)_6Si_2$	1450-14-2	**	8.0	PE	5276
			**	8.69 (V)	PE	3504
			**	8.35 ± 0.12	EI	3548
			**	8.46 ± 0.15	EI	3549
$C_7H_{20}Si_2^+$	$((CH_3)_3Si)_2CH_2$	2117-28-4	**	9.5 (V)	PE	4457
$C_8H_{20}Si_2^+$	$C_8H_{20}Si_2$	18178-59-1	**	9.19 (V)	PE	4715
$C_8H_{22}Si_2^+$	$(CH_3)_3SiCH_2CH_2Si(CH_3)_3$	6231-76-1	**	8.78 (V)	PE	4457
$C_9H_{24}Si_2^+$	$(CH_3)_3Si(CH_2)_3Si(CH_3)_3$	2295-05-8	**	9.41 (V)	PE	4457
$C_{10}H_{18}Si_2^+$	$((CH_3)_3SiCC)_2$	4526-07-2	**	8.85 (V)	PE	5332
$C_{10}H_{22}Si_2^+$	$C_{10}H_{22}Si_2$	18081-31-7	**	8.45 ± 0.04	EI	4274
	$CH_2 = C(Si(CH_3)_3)C(Si(CH_3)_3) = CH_2$	22472-36-2	**	8.65 ± 0.04	EI	4274
	$C_{10}H_{22}Si_2$	22500-95-4	**	8.45 ± 0.04	EI	4274
	<i>trans,trans</i> - $((CH_3)_3SiCH = CH)_2$	22430-47-3	**	8.43 ± 0.04	EI	4274
$C_{10}H_{24}Si_2^+$	$C_{10}H_{24}Si_2$	XXXXX-XX-X	**	8.30 (V)	PE	5535
$C_{11}H_{20}Si_2^+$	$C_6H_5Si_2(CH_3)_5$ (Disilane, pentamethylphenyl-)	1130-17-2	**	8.35 (V)	PE	3946
			**	8.35 ± 0.15	EI	3549
			**	8.37	CTS	3946
	$C_6H_5(SiH(CH_3)_2)Si(CH_3)_3$ (Silane, [4-(dimethylsilyl)phenyl]trimethyl-)	27856-24-2	**	8.4 ± 0.2	EI	4121
$C_{11}H_{22}Si_2^+$	$C_5H_4(Si(CH_3)_3)_2$ (Silane, 2,4-cyclopentadien-1-ylidenebis[trimethyl-])	33630-76-1	**	8.05 (V)	PE	5535

Ion	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{12}H_{10}Si_2^+$	$C_8H_8Si(CH_3)Si(CH_3)_3$ (2-Silaindan, 2-methyl-2-(trimethylsilyl)-)	27490-20-6	**	8.37	CTS	3546
$C_{12}H_{22}Si_2^+$	$C_6H_5CH_2Si_2(CH_3)_5$ (Disilane, pentamethyl(phenylmethyl)-)	3098-82-6	**	8.27	CTS	3546
	$C_6H_4(Si(CH_3)_3)_2$ (Silane, 1,4-phenylenebis(trimethyl)-)	13183-70-5	**	8.98 (V)	PE	5380
$C_{12}H_{24}Si_2^+$	$C_6H_8(Si(CH_3)_3)_2$ (Silane, 2,5-cyclohexadiene-1,4-diylbis(trimethyl- <i>trans</i> -))	54380-47-1	**	7.70 (V)	PE	5535
$C_{12}H_{28}Si_2^+$	$C_{12}H_{20}Si_2$ (Silane, 2,3-dimethyl-2-butene-1,4-diylbis(trimethyl- <i>trans</i> -))	XXXXX-XX-X	**	7.70 (V)	PE	5535
$C_{12}H_{30}Si_2^+$	(tert-C ₄ H ₉ Si(CH ₃) ₂) ₂	63262-93-1	**	8.52 (V)	PE	4683
$C_{13}H_{22}Si_2^+$	$C_6H_5CH=CHSi_2(CH_3)_5$ (Disilane, pentamethyl(2-phenylethenyl)-, (E)-)	40595-36-6	**	7.73±0.04	EI	4097
$C_{13}H_{24}Si_2^+$	$C_6H_5CH(Si(CH_3)_3)_2$ (Silane, (phenylmethylene)bis(trimethyl))	14595-77-8	**	8.10	PE	5574
			**	8.10 (V)	PE	5012
$C_{14}H_{22}Si_2^+$	$C_{14}H_{22}Si_2$ (2,6-Disila-s-indacene, 1,2,3,5,6,7-hexahydro-2,2,6,6-tetramethyl-)	69020-20-2	**	7.80 (V)	PE	5629
$C_{14}H_{24}Si_2^+$	$C_9H_7Si_2(CH_3)_5$ (Disilane, 1-indanylpentamethyl-)	27490-23-9	**	8.07	CTS	3546
	$C_6H_5CH=C(Si(CH_3)_3)_2$ (Silane, (phenylethenylidene)bis(trimethyl)-)	18415-23-1	**	8.12±0.04	EI	4097
$C_{14}H_{26}Si_2^+$	$C_6H_4(CH_2Si(CH_3)_3)_2$ (Silane, [1,2-phenylenebis(methylene)bis(trimethyl)-)	18412-14-1	**	8.05 (V)	PE	5012
			**	8.05 (V)	PE	5629
	$C_{14}H_{26}Si_2$ (Silane, [1,3-phenylenebis(methylene)]bis(trimethyl)-)	18412-15-2	**	8.05 (V)	PE	5629
			**	8.10 (V)	PE	5012
	$C_6H_4(CH_2Si(CH_3)_3)_2$ (Silane, [1,4-phenylenebis(methylene)]bis(trimethyl))	17557-09-4	**	7.75	PE	5574
			**	7.75 (V)	PE	5012
$C_{14}H_{32}Si_2^+$	$C_{14}H_{32}Si_2$	XXXXX-XX-X	**	7.90 (V)	PE	5535
$C_{15}H_{22}Si_2^+$	$C_{10}H_7Si_2(CH_3)_5$ (Disilane, pentamethyl-1-naphthalenyl-)	38446-40-1	**	7.95	CTS	3758
$C_{15}H_{24}Si_2^+$	$C_{10}H_8(Si(CH_3)_3)_2$ (Silane, 1 <i>H</i> -indene-1,2-diylbis(trimethyl)-)	26205-36-7	**	7.54±0.01	EI	3805

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{16}H_{22}Si_2^+$	$(C_6H_5)_2SiCH_3Si(CH_3)_3$ (Disilane, 1,1,1,2-tetramethyl-2,2-diphenyl-)	1450-16-4	**	8.38 ± 0.15	EI	3549
	$(C_6H_5)(CH_3)_2Si_2$ (Disilane, 1,1,2,2-tetramethyl-1,2-diphenyl-)	1145-98-8	**	8.11 ± 0.15	EI	3549
$C_{16}H_{30}Si_2^+$	$C_{10}H_{16}Si_2$ (Silane, [(2,5-dimethyl-1,4-phenylene)bis(methylene)]bis[trimethyl-])	69020-19-5	**	7.70 (V)	PE	5629
	$C_{10}H_{30}Si_2$ (Silane, [(4,6-dimethyl-1,3-phenylene)bis(methylene)]bis[trimethyl-])	62347-03-9	**	7.95 (V)	PE	5629
$C_{18}H_{31}Si_2^+$	$C_{18}H_{31}Si_2$ (Silane, [(2,3,5,6-tetramethyl-1,4-phenylene)bis(methylene)]bis[trimethyl-])	69020-17-3	**	7.25 (V)	PE	5629
$C_{20}H_{30}Si_2^+$	$(C_6H_5)(CH_2Si(CH_3)_3)_2$ (Silane, [[1,1'-biphenyl]-4,4'-diylbis(methylene)]bis[trimethyl-])	61342-05-0	**	7.60 (V)	PE	5012
$C_{20}H_{38}Si_2^+$	$C_6H_5(CH_2Si(C_2H_5)_3)_2$ (Silane, [1,4-phenylenebis(methylene)]bis[triethyl-])	18724-34-0	**	7.75	PE	5574
$C_{21}H_{24}Si_2^+$	$(C_6H_5)_3SiSi(CH_3)_3$ (Disilane, 1,1,1-trimethyl-2,2,2-triphenyl-)	1450-18-6	**	8.30 ± 0.15	EI	3549
$C_{24}H_{26}Si_2^+$	$C_{10}H_7(Si(CH_3)_2)_2C_{10}H_7$ (Disilane, 1,1,2,2-tetramethyl-1,2-di-1-naphthalenyl-)	38446-41-2	**	7.91	CTS	3758
$C_{26}H_{26}Si_2^+$	$((C_6H_5)_2CH_2Si)_2$ (Disilane, 1,2-dimethyl-1,1,2,2-tetraphenyl-)	1172-76-5	**	8.05 ± 0.15	EI	3549
$C_{36}H_{30}Si_2^+$	$((C_6H_5)_3Si)_2$ (Disilane, hexaphenyl-)	1450-23-3	**	8.16 ± 0.15	EI	3549
$C_8H_{24}Si_3^+$	$Si_3(CH_3)_8$	3704-44-7	**	8.19 (V)	PE	3504
$C_{16}H_{32}Si_3^+$	$C_6H_5C(Si(CH_3)_3)_3$ (Silane, (phenylmethylidene)tris[trimethyl-])	14595-76-7	**	8.10	PE	5574
			**	8.10 (V)	PE	5012
$C_{17}H_{28}Si_3^+$	$C_{10}H_7Si_3(CH_3)_7$ (Trisilane, 1,1,1,2,2,3,3-heptamethyl-3-(1-naphthalenyl)-)	38446-42-3	**	7.93	CTS	3758
	$C_{10}H_7Si(Si(CH_3)_3)_2CH_3$ (Trisilane, 1,1,1,2,3,3,3-heptamethyl-2-(-naphthalenyl)-)	38446-43-4	**	7.85	CTS	3758
$C_{18}H_{36}Si_3^+$	$C_6H_5(CH_2Si(CH_3)_3)_3$ (Silane, [1,3,5-benzenetriyltris(methylene)]tris[trimethyl-])	59305-32-7	**	7.85 (V)	PE	5012
				7.85 (V)	PE	5629
$C_{21}H_{12}Si_3^+$	$C_{21}H_{12}Si_3$ (Silane, [(2,4,6-trimethyl-1,3,5-benzenetriyl)tris(methylene)]tris[trimethyl-])	69020-18-4	**	7.40 (V)	PE	5629

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{26}H_{32}Si_3^+$	$C_{10}H_7(Si(CH_3)_2)_3C_{10}H_7$ (Trisilane, 1,1,2,2,3,3-hexamethyl-1,3-di-1-naphthalenyl-)	38580-43-7	**	7.92	CTS	3758
$C_6H_{16}Si_4^+$	$C_6H_{16}Si_4$ (1,3,5,7-Tetrasilatricyclo[3.3.1.1 ^{3,7}]decane)	281-44-7	**	9.0±0.05	PE	3855
			**	9.7 (V)	PE	4000
$C_{10}H_{24}Si_4^+$	$C_6H_{12}Si_4(CH_3)_4$ (1,3,5,7-Tetrasilatricyclo[3.3.1.1 ^{3,7}]decane, 1,3,5,7-tetramethyl-)	17995-33-4	**	8.45±0.05	PE	3855
$C_{10}H_{30}Si_4^+$	<i>n</i> - $Si_4(CH_3)_{10}$	865-76-9	**	7.98 (V)	PE	3504
$C_{18}H_{38}Si_4^+$	$C_{18}H_{38}Si_4$ (Silane, 1,2,4,5-benzenetetrayltetrakis(trimethyl-))	17156-61-5	**	8.30 (V)	PE	5319
$C_{18}H_{40}Si_4^+$	$C_6H_4(Si(CH_3)_2)_4$ (Silane, 2,5-cyclohexadiene-1,4-diyltetrakis(trimethyl-))	XXXXX-XX-X	**	7.00 (V)	PE	5535
$C_{18}H_{44}Si_4^+$	((CH_3) ₃ SiCH ₂) ₄ C=C	XXXXX-XX-X	**	7.15 (V)	PE	5535
$C_{20}H_{42}Si_4^+$	$C_6H_4(CH(Si(CH_3)_2))_2$ (Silane(1,4-phenylenedimethylidene)tetrakis(trimethyl))	17557-10-7	**	7.40	PE	5574
			**	7.40 (V)	PE	5012
$C_{20}H_{48}Si_4^+$	(tert-C ₄ H ₉ SiCH ₃) ₄		**	7.42 (V)	PE	4683
$C_{22}H_{46}Si_4^+$	$C_6H_2(CH_2Si(CH_3)_2)_4$ (Silane, [1,2,4,5-benzenetetrayltetrakis(methylene)] tetrakis(trimethyl-))	64131-86-8		7.10 (V)	PE	5012
			**	7.10 (V)	PE	5629
$C_{22}H_{48}Si_4^+$	$C_{10}H_{12}(Si(CH_3)_2)_4$ (Silane, (1,2,3,4,5,6,7,8-octahydro-1,4,5,8-naphthalenetetrayl) tetrakis(trimethyl-))	XXXXX-XX-X	**	6.98 (V)	PE	5535
$C_{10}H_{30}Si_5^+$	$Si_5(CH_3)_{10}$ (Cyclopentasilane, decamethyl-)	13452-92-1	**	7.94 (V)	PE	3504
$C_{12}H_{36}Si_5^+$	$Si(Si(CH_3)_2)_4$	4098-98-0	**	8.24 (V)	PE	3504
$C_{12}H_{36}Si_6^+$	$Si_6(CH_3)_{12}$ (Cyclohexasilane, dodecamethyl-)	4098-30-0	**	7.79 (V)	PE	3504
$C_{22}H_{54}Si_6^+$	(((CH ₃) ₃ Si) ₂ CC) ₂	20932-80-3	**	7.60 (V)	PE	5332
$C_{26}H_{58}Si_6^+$	$C_6H_4(C(Si(CH_3)_2))_2$ (Silane(1,4-phenylenedimethanetetrayl)hexakis)	17557-11-8	**	7.45	PE	5574

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₂₆H₅₈Si⁺₆	C ₆ H ₄ (C(Si(CH ₃) ₃) ₂) ₂	17557-11-8	**	7.45 (V)	PE	5012
C₃₀H₆₆Si⁺₆	C ₆ (CH ₂ Si(CH ₃) ₃) ₆ (Silane, [1,2,3,4,5,6-benzenehexaylhexakis(methylene)] hexakis(trimethyl)-)	64131-87-9	**	7.40 (V)	PE	5012
			**	7.40 (V)	PE	5629
C₁₆H₃₆Si⁺₇	C ₁₆ H ₁₈ Si ₇ (CH ₃) ₆ (2 <i>H</i> -1,5,8,12-Dimethano-3,6a,10-metheno-1,3,5,6a,8,10,12-heptasilaoctalene, dodecahydro-1, 3,5,8,10,12-hexamethyl-)	26393-20-4	**	7.9±0.05	PE	3855
NSi₂⁺	Si ₂ N	12293-67-3	**	9.5±0.5	EI	3810
			**	9.3±0.5	EI	4200
H₃N₃Si⁺	SiH ₃ N ₃	13847-60-4	**	10.33±0.02 (V)	PE	3670
H₉NSi₃⁺	(SiH ₃) ₃ N	13862-16-3	**	9.7±0.1 (V)	PE	3661
C₂H₉NSi⁺	(CH ₃) ₂ NSiH ₃	2875-98-1	**	8.5±0.1 (V)	PE	3661
C₁H₁₃NSi⁺	NH ₂ (CH ₂ Si(CH ₃) ₃)	18166-02-4	**	9.07 (V)	PE	5102
C₅H₁₅NSi⁺	NH(CH ₃)(CH ₂ Si(CH ₃) ₃)	18135-05-2	**	8.55 (V)	PE	5102
C₆H₁₇NSi⁺	C ₆ H ₁₇ NSi	13014-85-2	**	8.46 (V)	PE	5102
	(CH ₃) ₂ NCH ₂ Si(CH ₃) ₄	18182-40-6	**	7.61	PI	5543
			**	7.63±0.05	PE	4192
			**	8.20 (V)	PE	5102
C₇H₁₉NSi⁺	C ₇ H ₁₉ NSi (<i>tert</i> -C ₄ H ₉ NHSi(CH ₃) ₃)	5577-67-3	**	8.41±0.05 (V)	PE	4725
C₈H₁₃NSi⁺	C ₅ H ₄ NS(CH ₃) ₃ (Pyridine, 2-(trimethylsilyl)-)	13737-04-7	**	8.90±0.05 (V)	PE	3685
	C ₅ H ₄ NS(CH ₃) ₃ (Pyridine, 4-(trimethylsilyl)-)	18301-46-7	**	9.30±0.05 (V)	PE	3685
C₈H₂₁NSi⁺	C ₈ H ₂₁ NSi	10545-36-5	**	7.93 (V)	PE	5102
C₉H₁₁NSi⁺	C ₆ H ₄ (N(CH ₃) ₂)SiH(CH ₃) ₂ (Benzenamine, 4-(dimethylsilyl)- <i>N,N</i> -dimethyl-)	2516-75-8	CH ₃	7.08	EI	4125
C₉H₂₁NSi⁺	C ₃ H ₁₀ NCH ₂ Si(CH ₃) ₃ (Piperidine, 1-[(trimethylsilyl)methyl]-)	17877-17-7	**	8.18 (V)	PE	5102
C₇H₁₈N₂Si⁺	<i>tert</i> -C ₄ H ₉ N=NSi(CH ₃) ₃	25811-66-9	**	7.6±0.2 (V)	PE	4581

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_9H_{11}N_2Si^+$	$C_9H_5N=NSi(CH_3)_3$ (Diazene, phenyl(trimethylsilyl)-)	17881-28-6	**	7.85 ± 0.2 (V)	PE	4581
$C_3H_9N_3Si^+$	$(CH_3)_3SiN_3$	4648-54-8	**	9.7 ± 0.1 (V)	PE	3670
$C_6H_{12}N_4Si^+$	$((CH_3)_2N)_4Si$	1624-01-7	** **	8.39 (V) 8.69 (V)	PE PE	3503 4588
$CH_9NSi_2^+$	$(SiH_3)_2NCH_3$	4459-06-7	**	9.2 ± 0.1 (V)	PE	3661
$C_6H_{19}NSi_2^+$	$((CH_3)_3Si)_2NH$	999-97-3	** **	8.66 (V) 8.79 ± 0.05 (V)	PE PE	4181 4725
$C_8H_{21}NSi_2^+$	$C_8H_6NSi_2(CH_3)_5$ (1-Aza-3,5-disilacyclohexane, 1,3,3,5,5-pentamethyl-)	69320-68-9	**	7.90 (V)	PE	5102
$C_8H_{23}NSi_2^+$	$NH(CH_2Si(CH_3)_3)_2$	17882-91-6	**	8.36 (V)	PE	5102
$C_9H_{25}NSi_2^+$	$CH_3N(CH_2Si(CH_3)_3)_2$	69320-67-8	**	7.86 (V)	PE	5102
$C_{10}H_{27}NSi_2^+$	$C_{10}H_{27}NSi_2$	17988-70-4	**	7.82 (V)	PE	5102
$C_{11}H_{21}NSi_2^+$	$C_5H_3N(Si(CH_3)_3)_2$ (Pyridine, 2,5-bis(trimethylsilyl)-)	35505-51-2	**	8.65 ± 0.05 (V)	PE	3685
	$C_5H_3N(Si(CH_3)_3)_2$ (Pyridine, 2,6-bis(trimethylsilyl)-)	35505-52-3	**	8.50 ± 0.05 (V)	PE	3685
$C_6H_{18}N_2Si_2^+$	$C_6H_{18}N_2Si_2$	13436-03-8	**	7.1 ± 0.2 (V)	PE	4581
$C_8H_{24}N_4Si_2^+$	$N_4Si_2(CH_3)_8$ (1,2,4,5-Tetraaza-3,6-disilacyclohexane, 1,2,3,3,4,5,6,6-octamethyl-)	53213-29-9	**	~ 7.5 (V)	PE	5504
$C_9H_{27}NSi_3^+$	$((CH_3)_3Si)_3N$	1586-73-8	**	8.60 (V)	PE	4181
$C_{12}H_{33}NSi_3^+$	$N(CH_2Si(CH_3)_3)_3$	4438-47-5	**	7.66 (V)	PE	5102
$C_{10}H_{28}N_2Si_4^+$	$C_2H_4N_2Si_4(CH_3)_8$ (1,5-Diaza-2,4,6,8-tetrasilabicyclo[3.3.0]octane, 2,2,4,4,6,6,8,8-octamethyl-)	XXXXXX-XX-X	**	7.15 (V)	PE	5504
$C_{12}H_{36}N_2Si_4^+$	$((CH_3)_3Si)_2N_2$	20156-62-1	**	~ 7.95 (V)	PE	5504
$B_2C_7H_{21}N_3Si^+$	$N_3B_2(CH_3)_3Si(CH_3)_3$ (1,2,4,3,5-Triazadiborolidine, 1,2,3,5-tetramethyl-4-(trimethylsilyl)-)	53323-98-1	**	7.48 (V)	PE	4526
	$N_3B_2(CH_3)_3Si(CH_3)_3$ (1,2,4,3,5-Triazadiborolidine, 1,3,4,5-tetramethyl-2-(trimethylsilyl)-)	53246-18-7	**	7.56 (V)	PE	4526

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$^{18}\text{OSi}^+$	Si^{18}O	10097-28-6	** ** ** ** **	11.43 10.2 ± 0.5 11.3 ± 0.3 11.3 ± 0.5 11.5 ± 0.3	S EI EI EI EI	5049 3985 4005 3810 3610
$\text{H}_6\text{Si}_2\text{O}^+$	$(\text{SiH}_3)_2\text{O}$	13597-73-4	** **	11.17 (V) 11.19 (V)	PE PE	3656 3844
LiOSi^+	LiSiO	XXXXX-XX-X	**	6.3 ± 0.3	EI	5393
CH_6OSi^+	CH_3OSiH_3	2171-96-2	**	10.61 (V)	PE	3844
$\text{C}_3\text{H}_9\text{SiO}^+$	$(\text{CH}_3)_3\text{SiOSi}(\text{CH}_3)_3$ $(\text{CH}_3)_3\text{SiOSi}(\text{CH}_3)_2\text{OSi}(\text{CH}_3)_3$ $(\text{CH}_3)_3\text{SiOSi}(\text{CH}_3)(\text{C}_2\text{H}_5)\text{OSi}(\text{CH}_3)_3$ $(\text{CH}_3)_3\text{SiOSi}(\text{CH}_3)(\text{C}_2\text{H}_5)\text{OSi}(\text{CH}_3)_3$	107-46-0 107-51-7 5356-85-4 17861-60-8	3 3	21.8 ± 0.2 21.8 ± 0.2 23.6 ± 0.2 21.8 ± 0.2	EI EI EI EI	3444 3444 3444 3444
$\text{C}_5\text{H}_{12}\text{OSi}^+$	$(\text{CH}_3)_3\text{SiCOCH}_3$	13411-48-8	** **	8.6 (V) 8.64	PE PE	4139 4395
$\text{C}_8\text{H}_{11}\text{OSi}^+$	$\text{C}_6\text{H}_5(\text{OCH}_3)\text{SiH}(\text{CH}_3)_2$ (Silane, (4-methoxyphenyl)dimethyl-)	1432-38-8	CH_3	8.13	EI	4125
$\text{C}_9\text{H}_{14}\text{OSi}^+$	$\text{C}_6\text{H}_5\text{Si}(\text{CH}_3)_2\text{OCH}_3$ (Silane, methoxydimethylphenyl-)	17881-88-8	**	9.34	EI	5421
$\text{C}_{10}\text{H}_{11}\text{OSi}^+$	<i>tert</i> -(CH_3) ₃ SiCOC_6H_5 (Silane, benzoyltrimethyl-)	5908-41-8	**	7.96	PE	4395
$\text{C}_{10}\text{H}_{16}\text{OSi}^+$	$\text{CH}_3\text{C}_6\text{H}_4\text{Si}(\text{CH}_3)_2\text{OCH}_3$ (Silane, methoxydimethyl(3-methylphenyl)-) $\text{CH}_3\text{C}_6\text{H}_4\text{Si}(\text{CH}_3)_2\text{OCH}_3$ (Silane, methoxydimethyl(4-methylphenyl)-) $\text{CH}_3\text{OC}_6\text{H}_4\text{Si}(\text{CH}_3)_3$ (Silane, (4-methoxyphenyl)trimethyl-)	62244-47-7 51501-87-2 877-68-9	** ** ** **	8.97 9.09 8.47 (V) 8.03	EI EI PE CTS	5421 5421 5380 3758
$\text{C}_{13}\text{H}_{11}\text{OSi}^+$	$\text{C}_{12}\text{H}_9\text{OSi}(\text{CH}_3)_2$ (10H-Phenoxasilin, 10,10-dimethyl-)	18414-62-5	CH_3	8.5 ± 0.1	EI	4664
$\text{C}_{13}\text{H}_{18}\text{OSi}^+$	$\text{C}_9\text{H}_7\text{Si}(\text{CH}_3)_2\text{OC}_2\text{H}_5$ (Silane, ethoxy-1 <i>H</i> -inden-1-yl dimethyl-)	41273-57-8	**	7.63 ± 0.01	EI	3805
$\text{C}_{13}\text{H}_{20}\text{OSi}^+$	$\text{C}_9\text{H}_7\text{Si}(\text{CH}_3)_2\text{OC}_2\text{H}_5$ (Silane, (2,3-dihydro-1 <i>H</i> -inden-1-yl)ethoxydimethyl-)	41273-53-4	**	7.81 ± 0.01	EI	3805
$\text{C}_{11}\text{H}_{14}\text{OSi}^+$	$\text{C}_{12}\text{H}_9\text{OSi}(\text{CH}_3)_2$ (10H-Phenoxasilin, 10,10-dimethyl-)	18414-62-5	**	8.0 ± 0.1	EI	4664

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_3H_{12}O_2Si^+$	$C_3H_6Si(OCH_3)_2$ (Silacyclobutane, 1,1-dimethoxy-)	33446-84-3	**	10.15 (V)	PE	4077
$C_{10}H_{16}O_2Si^+$	$CH_3OC_6H_4Si(CH_3)_2OCH_3$ (Silane,methoxy(4-methoxyphenyl)dimethyl-)	62244-48-8	**	8.62	EI	5421
$C_8H_{20}O_4Si^+$	$(C_2H_5O)_4Si$	78-10-4	**	9.77 (V)	PE	3503
$C_6H_{18}OSi_2^+$	$((CH_3)_3Si)_2O$	107-46-0	**	9.88 (V)	PE	4181
$C_{11}H_{20}OSi_2^+$	$C_6H_4(SiH(CH_3)_2)Si(CH_3)_2OCH_3$ (Silane, [3-(dimethylsilyl)phenyl]methoxydimethyl-)	XXXXX-XX-X	**	8.5 ± 0.2	EI	4121
	$C_6H_4(SiH(CH_3)_2)Si(CH_3)_2OCH_3$ (Silane, [4-(dimethylsilyl)phenyl]methoxydimethyl-)	33546-26-8	**	8.6 ± 0.2	EI	4121
$C_{12}H_{22}OSi_2^+$	$C_6H_4(OCH_3)Si_2(CH_3)_5$ (Disilane, (4-methoxyphenyl)pentametyl-)	4199-03-5	**	7.85	CTS	3758
$C_7H_{19}O_2Si_2^+$	$(CH_3)_3SiO(CH_2)_2OSi(CH_3)_3$	7381-30-8	CH_3	9.5 ± 0.1	EI	4300
$C_8H_{21}O_2Si_2^+$	$(CH_3)_3SiO(CH_2)_3OSi(CH_3)_3$	17887-80-8	CH_3	9.4 ± 0.1	EI	4300
$C_9H_{23}O_2Si_2^+$	$(CH_3)_3SiO(CH_2)_4OSi(CH_3)_3$	18001-91-7	CH_3	9.3 ± 0.1	EI	4300
$C_{10}H_{25}O_2Si_2^+$	$(CH_3)_3SiO(CH_2)_5OSi(CH_3)_3$	54494-06-3	CH_3	9.3 ± 0.1	EI	4300
$C_{11}H_{20}O_2Si_2^+$	$C_6H_4(SiH(CH_3)_2)Si(OCH_3)_2CH_3$ (Silane, [3-(dimethylsilyl)phenyl]dimethoxymethyl-)	XXXXX-XX-X	**	8.8 ± 0.2	EI	4121
	$C_6H_4(SiH(CH_3)_2)Si(OCH_3)_2CH_3$ (Silane, [4-(dimethylsilyl)phenyl]dimethoxymethyl-)	34239-01-5	**	8.5 ± 0.2	EI	4121
$C_{11}H_{27}O_2Si_2^+$	$(CH_3)_3SiO(CH_2)_6OSi(CH_3)_3$	6222-22-6	CH_3	9.3 ± 0.1	EI	4300
$C_{12}H_{29}O_2Si_2^+$	$(CH_3)_3SiO(CH_2)_7OSi(CH_3)_3$	54494-07-4	CH_3	9.4 ± 0.1	EI	4300
$C_{11}H_{20}O_3Si_2^+$	$C_6H_4(SiH(CH_3)_2)Si(OCH_3)_3$ (Silane, [3-(dimethylsilyl)phenyl]trimethoxy-)	XXXXX-XX-X	**	9.0 ± 0.2	EI	4121
$NOSi_2^+$	Si_2NO	12033-47-5	**	10.8 ± 0.5	EI	3810
CH_3NOSi^+	SiH_4NCO	13730-13-7	**	11.10 ± 0.02 (V)	PE	3670
$C_4H_9NOSi^+$	$(CH_3)_3SiNCO$	1118-02-1	**	10.3 ± 0.1 (V)	PE	3670

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$\text{C}_8\text{H}_{13}\text{NOSi}^+$	$\text{C}_5\text{H}_4\text{N}(\text{O})\text{Si}(\text{CH}_3)_3$ (Pyridine, 4-(trimethylsilyl)-, 1-oxide)	28867-06-3	**	8.19 (V)	PE	4222
$\text{C}_{11}\text{H}_{19}\text{NOSi}^+$	$(\text{CH}_3)_2\text{NC}_6\text{H}_4\text{Si}(\text{CH}_3)_2\text{OCH}_3$ (Benzenamine, 4-(methoxydimethylsilyl)-N,N-dimethyl-)	62244-49-9	**	7.45	EI	5421
$\text{C}_9\text{H}_{13}\text{NO}_2\text{Si}^+$	$\text{NO}_2\text{C}_6\text{H}_4\text{Si}(\text{CH}_3)_3$ (Silane, trimethyl(4-nitrophenyl)-)	4405-33-8	**	9.80 (V)	PE	5380
$\text{C}_6\text{H}_{13}\text{NO}_3\text{Si}^+$	$\text{N}(\text{CH}_2\text{CH}_2\text{O})_3\text{SiH}$ (2,8,9-Trioxa-5-aza-silabicyclo[3.3.3]undecane)	283-60-3	**	~ 10.1	PE	4413
$\text{C}_7\text{H}_{15}\text{NO}_3\text{Si}^+$	$\text{N}(\text{CH}_2\text{CH}_2\text{O})_3\text{SiCH}_3$ (2,8,9-Trioxa-5-aza-1-silabicyclo[3.3.3]undecane, 1-methyl-)	2288-13-3	**	8.7 (V)	PE	4413
$\text{C}_9\text{H}_{13}\text{NO}_3\text{Si}^+$	$\text{NO}_2\text{C}_6\text{H}_4\text{Si}(\text{CH}_3)_2\text{OCH}_3$ (Silane, methoxydimethyl(4-nitrophenyl)-)	62244-50-2	**	9.44	EI	5421
$\text{C}_8\text{H}_{17}\text{NO}_4\text{Si}^+$	$\text{N}(\text{CH}_2\text{CH}_2\text{O})_3\text{SiOC}_2\text{H}_5$ (2,8,9-Trioxa-5-aza-1-silabicyclo[3.3.3]undecane, 1-ethoxy-)	3463-21-6	**	10.6 (V)	PE	4413
F_2Si^+	SiF_2	13966-66-0	**	10.78 ± 0.05	PE	4138
$(^2\text{A}_1)$			**	11.08 (V)	PE	4322
$(^2\text{A}_1)$			**	15.57 (V)	PE	4322
$(^2\text{A}_2, ^2\text{B}_2)$			**	17.08 (V)	PE	4322
$(^2\text{B}_1, ^2\text{A}_1)$						
F_3Si^+	CH_3SiF_3	373-74-0	CH_3	13.33 ± 0.05	PI	4907
F_4Si^+	SiF_4	7783-61-1	**	15.19	PI	4907
			**	16.45 (V)	PE	4322
			**	16.46 ± 0.04 (V)	PE	3880
			**	15.4 ± 1	EI	4894
F_6Si_2^+	Si_2F_6	13830-68-7	**	13.20 ± 0.02 (V)	PE	4026
H_3FSi^+	SiH_3F	13537-33-2	**	12.58 (V)	PE	3511
			**	12.6 ± 0.1 (V)	PE	3510
			**	16.1 ± 0.1 (V)	PE	3502
			**	13.0 ± 1	EI	4894
$\text{H}_2\text{F}_2\text{Si}^+$	SiH_2F_2	13824-36-7	**	12.85 (V)	PE	3511
			**	12.85 (V)	PE	3694
			**	12.9 ± 0.1 (V)	PE	3510
			**	11.0 ± 1	EI	4894
HF_3Si^+	SiHF_3	13465-71-9	**	14.48 ± 0.02 (V)	PE	4026
			**	14.48 ± 0.05 (V)	PE	5419
			**	11.0 ± 1	EI	4894

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_2H_6FSi^+$	$(CH_3)_3SiF$	420-56-4	CH_3	10.70 ± 0.04	PI	4907
$C_3H_9FSi^+$	$(CH_3)_3SiF$	420-56-4	** **	10.31 ± 0.04 11.0 (V)	PI PE	4907 4972
$C_5H_9FSi^+$	$(CH_3)_3SiC \equiv CF$	38346-22-4	**	9.8 ± 0.1	PE	4002
$C_6H_{15}FSi^+$	$(C_2H_5)_3SiF$	358-43-0	**	10.1 (V)	PE	4972
$C_7H_8FSi^+$	$C_6H_5Si(CH_3)_2F$ (Silane, fluorodimethylphenyl-)	454-57-9	CH_3	10.83	EI	5366
$C_8H_{10}FSi^+$	$CH_3C_6H_4Si(CH_3)_2F$ (Silane, fluorodimethyl(3-methylphenyl)-)	33664-04-9	CH_3	10.92	EI	5366
	$CH_3C_6H_4Si(CH_3)_2F$ (Silane, fluorodimethyl(4-methylphenyl)-)	33664-05-0	CH_3	10.82	EI	5366
$C_8H_{11}FSi^+$	$C_6H_5Si(CH_3)_2F$ (Silane, fluorodimethylphenyl-)	454-57-9	**	9.17	EI	5421
$C_9H_{13}FSi^+$	$CH_3C_6H_4Si(CH_3)_2F$ (Silane, fluorodimethyl(3-methylphenyl)-)	33664-04-9	**	8.86	EI	5421
	$CH_3C_6H_4Si(CH_3)_2F$ (Silane, fluorodimethyl(4-methylphenyl)-)	33664-05-0	**	8.86	EI	5421
	$FC_6H_4Si(CH_3)_3$ (Silane, (4-fluorophenyl)trimethyl-)	455-17-4	**	9.0 (V)	PE	5380
$CH_3F_2Si^+$	$(CH_3)_2SiF_2$	353-66-2	CH_3	11.70 ± 0.03	PI	4907
$C_2H_6F_2Si^+$	$(CH_3)_2SiF_2$	353-66-2	** **	11.03 ± 0.03 11.5 (V)	PI PE	4907 4972
$C_4H_6F_2Si^+$	$C_4H_6SiF_2$ (Silacyclopent-3-ene, 1,1-difluoro-)	XXXXX-XX-X	**	9.62 (V)	PE	4517
$C_4H_{10}F_2Si^+$	$(C_2H_5)_2SiF_2$	358-06-5	**	10.5 (V)	PE	4972
$CH_3F_3Si^+$	CH_3SiF_3	373-74-0	** ** **	12.48 ± 0.04 13.2 (V) 13.24 ± 0.02 (V)	PI PE PE	4907 4972 4026
$C_5H_5F_3Si^+$	$C_5H_5(SiF_3)$ (Silane, 2,4-cyclopentadien-1-yl trifluoro-)	55765-70-3	**	9.1 (V)	PE	4373
$C_7H_{10}F_6Si^+$	<i>cis</i> -(CH_3) ₂ SiC(CF ₃)=C(CF ₃)H	35186-03-9	**	9.86	PE	3589

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{10}H_{17}FSi_2^+$	$C_6H_5(SiF(CH_3)_2)SiH(CH_3)_2$ (Silane, [4-(dimethylsilyl)phenyl]fluorodimethyl-)	33546-29-1	**	8.5 ± 0.2	EI	4121
$C_9H_{11}F_2Si_2^+$	$C_6H_5(SiF_2CH_3)SiH(CH_3)_2$ (Silane, 1,1-difluoro[4-(dimethylsilyl)phenyl]methyl-)	XXXXX-XX-X	**	8.7 ± 0.2	EI	4121
$C_8H_{11}F_3Si_2^+$	$C_6H_5(SiF_3)SiH(CH_3)_2$ (Silane, trifluoro[4-(dimethylsilyl)phenyl]-)	XXXXX-XX-X	**	9.2 ± 0.2	EI	4121
$C_6H_{12}F_4Si^+$	$C_6H_{12}Si_4F_4$ (1,3,5,7-Tetrasilatricyclo[3.3.1.1 ^{3,7}]decane, 1,3,5,7-tetrafluoro-)	33664-21-0	**	9.8 ± 0.05	PE	3855
$C_9H_{13}NFSi^+$	$(CH_3)_2NC_6H_4Si(CH_3)_2F$ (Benzenamine, 4-(fluorodimethylsilyl)-N,N-dimethyl-)	62244-56-8	CH_3	11.59	EI	5366
$C_{10}H_{16}NFSi^+$	$(CH_3)_2NC_6H_4Si(CH_3)_2F$ (Benzenamine, 4-(fluorodimethylsilyl)-N,N-dimethyl-)	62244-56-8	**	7.55	EI	5421
$C_2H_6NF_3Si^+$	$F_3SiN(CH_3)_2$	812-14-6	**	9.60 ± 0.05 (V)	PE	5419
$C_8H_{10}OFSi^+$	$CH_3OC_6H_4Si(CH_3)_2F$ (Silane, fluoro(4-methoxyphenyl)dimethyl-)	62244-55-7	CH_3	11.03	EI	5366
$C_9H_{13}OFSi^+$	$CH_3OC_6H_4Si(CH_3)_2F$ (Silane, fluoro(4-methoxyphenyl)dimethyl-)	62244-55-7	**	8.42	EI	5421
$C_7H_7NO_2FSi^+$	$NO_2C_6H_4Si(CH_3)_2F$ (Silane, fluorodimethyl(4-nitrophenyl)-)	62244-57-9	CH_3	10.71	EI	5366
$C_8H_{10}NO_2FSi^+$	$NO_2C_6H_4Si(CH_3)_2F$ (Silane, fluorodimethyl(4-nitrophenyl)-)	62244-57-9	**	9.77	EI	5421
$AlSi^+$	SiAl	12042-55-6	**	6.5 ± 1.0	EI	4005
$OAlSi^+$	SiAlO	37361-47-0	**	6.3 ± 1.0	EI	4005
			**	8.0 ± 1	EI	3985
P^+	P_2	12185-09-0		15.9	EI	3472
	PH_3	7803-51-2	$H_2 + H$	16.3	EI	3811
	PCl_3	7719-12-2	$Cl_2 + Cl$	18.5 ± 0.7	EI	3556
	PBr_3	7789-60-8	$Br_2 + Br$	16.7 ± 0.7	EI	3556
	$LaPO_4$	XXXXX-XX-X		13.0 ± 0.6	EI	5603
P_2^+	P_2	12185-09-0	**	10.7 ± 0.1	S	3567
$(^2\Pi_u)$			**	10.60	PE	3695
$(^2\Pi_g)$			**	10.62 ± 0.01 (V)	PE	4597
$(^2\Sigma_g)$			**	10.81 ± 0.01 (V)	PE	4597

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
P_2^+ ($^1\Sigma_g^+$) ($^1\Sigma_u^+$)	P_2	12185-09-0	**	10.84 (V)	PE	3695
			**	15.52±0.01 (V)	PE	4597
			**	9.7±0.5	EI	3458
			**	9.7	EI	4001
			**	10.3±0.5	EI	4120
			**	11.2	EI	3472
			**	11.4±0.5	EI	4098
			**	11.8±0.5	EI	3555
	P_4 ($^1\Sigma_g^+$)	12185-10-3		12.85±0.01	PI	4936
			P_2	12.85±0.03	PI	4924
P_3^+ ($^1\Sigma_g^+$)	P_3	55030-78-9	**	7.85±0.2	PI	4924
	P_4	12185-10-3		12.54±0.01	PI	4936
			P	12.54±0.03	PI	4924
P_4^+	P_4	12185-10-3	**	9.25	PI	4924
			**	9.34	PI	4936
			**	9.10±0.05	PE	3683
			**	9.2	PE	3643
			**	10.0±0.5	EI	4098
			**	10.8±0.3	EI	3555
HP^+	PH_3	7803-51-2	H_2	12.9	EI	3811
H_2P^+	PH_3	7803-51-2	H	13.4	EI	3811
H_3P^+	PH_3	7803-51-2	**	9.96±0.01	PE	3703
			**	9.96	PE	3719
			**	9.96	PE	5516
			**	10.59±0.05 (V)	PE	5419
			**	10.0	EI	3811
$H_1P_2^+$	P_2H_4	13445-50-6	**	9.69 (V)	PE	4584
BP^+	BP	20205-91-8	**	<13±2	EI	3619
CP^+	PC	12326-85-1	**	10.5±0.5	EI	3458
C_2P^+	C_2P	12602-39-0	**	10.9±0.5	EI	3458
CP_2^+	CP_2	12601-93-3	**	9.4±0.5	EI	3458
CHP^+ ($^2\Pi$) ($^2\Sigma$)	HCP	6829-52-3	**	10.79±0.01	PE	3840
			**	12.86±0.01	PE	3840
CH_5P^+	CH_3PH_2	593-54-4	**	9.12±0.07	PE	4152
			**	9.12	PE	5516
			**	9.6±0.1 (V)	PE	3661
			**	9.70 (V)	PE	4474

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_2H_3P^+$	$CH_3C\equiv P$	34627-31-1	**	9.89 ± 0.01 (V)	PE	5033
$C_2H_5P^+$	C_2H_5P (Phosphirane)	6569-82-0	**	9.4 ± 0.1	PE	4990
$C_2H_7P^+$	$(CH_3)_2PH$	676-59-5	** ** ** ** **	8.47 ± 0.07 8.47 8.5 ± 0.1 9.10 (V) 9.13 (V)	PE PE PE PE PE	4152 5516 4990 4474 4185
$C_3H_9P^+$	$(CH_3)_3P$	594-09-2	** ** ** ** ** ** ** ** ** ** **	8.01 ± 0.07 8.11 ± 0.1 8.11 8.6 ± 0.1 (V) 8.6 (V) 8.60 (V) 8.60 (V) 8.60 (V) 8.60 (V) 8.65 (V) 8.79	PE PE PE PE PE PE PE PE PE PE PE	4152 5042 5516 3661 5378 4226 4579 5368 4474 5602
$C_4H_{11}P^+$	$(C_2H_5)_2PH$ $(CH_3)_3P=CH_2$ $(CH_3)_3P=CH_2$ <i>tert</i> - $C_4H_9PH_2$	627-49-6 14580-91-7 29218-61-9 2501-94-2	** ** ** ** ** ** ** ** ** **	8.69 6.81 (V) 6.81 (V) 6.87 (V) 6.81 (V) 9.30 (V)	PE PE PE PE PE PE	3589 4579 5442 4181 5368 4474
$C_5H_9P^+$	C_5H_9P (Phosphorin)	289-68-9	**	9.2 (V)	PE	3832
$C_6H_7P^+$	$C_6H_5PH_2$ (Phosphine, phenyl-)	638-21-1	**	8.47 ± 0.01	PE	4154
$C_6H_9P^+$	$(C_2H_5)_3P$	3746-01-8	**	7.52 (V)	PE	5526
$C_6H_{13}P^+$	$(CH_3)_3P=CHCH=CH_2$	30417-65-3	**	6.20 (V)	PE	4579
$C_6H_{15}P^+$	$(C_2H_5)_3P$	554-70-1	** **	7.44 (V) 8.52	PE PE	5526 5602
$C_7H_{11}P^+$	$C_4H_2(CH_3)_2P(CH_3)$ (1H-Phosphole, 1,3,4-trimethyl-)	37739-99-4	**	8.25 (V)	PE	5618
$C_7H_{15}P^+$	$(CH_3)_3P=CHC(CH_3)=CH_2$ $(CH_3)_3P=CHCH=CHCH_3$	29218-65-3 61169-15-1	** **	6.20 (V) 6.02 (V)	PE PE	4579 4579
$C_8H_{11}P^+$	$(C_6H_5)(CH_3)_2P$ (Phosphine, dimethyl phenyl)	672-66-2	**	7.58 ± 0.05	PI	5278

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_8H_{11}P^+$	$(C_6H_5)(CH_3)_2P$	672-66-2	** **	7.81 ± 0.01 8.45 (V)	PE PE	4154 5378
$C_8H_{13}P^+$	$C_4H_9PC_4H_9$ (1H-Phosphole, 1-butyl-)	37739-98-3	**	8.45 (V)	PE	5618
$C_8H_{19}P^+$	$(tert-C_4H_9)_2PH$	819-19-2	**	8.35 (V)	PE	4474
$C_9H_7P^+$	C_9H_7P (Isophosphinoline)	253-37-2	**	8.04	PE	4515
$C_9H_{13}P^+$	$C_6H_5(CH_3)_2P=CH_2$ (Phosphorane, dimethylmethylenepheryl-)	29949-96-0	**	6.85 (V)	PE	4579
$C_9H_{21}P^+$	$(n-C_4H_9)_2PCH_3$	33374-48-0	**	8.20 (V)	PE	4423
$C_{10}H_9P^+$	$C_9H_9PCH_3$ (Isophosphinoline, 3-methyl-)	49622-63-1	**	7.96	PE	4515
$C_{10}H_{13}P^+$	$C_6H_5C_6H_5P$ (1H-Phosphole, 1-phenyl-)	20342-00-1	**	8.45 (V)	PE	4090
$C_{10}H_{13}P^+$	$C_6H_5C_6H_5P$ (Phospholane, 1-phenyl-)	3302-87-2	**	8.35 (V)	PE	4090
$C_{10}H_{15}P^+$	$(CH_3)_3P=CHC_6H_5$ (Phosphorane, trimethyl(phenylmethylene)-)	30417-68-6	**	6.19 (V)	PE	4579
$C_{10}H_{17}P^+$	$C_4H_9(CH_3)_2P(tert-C_4H_9)$ (1H-Phosphole, 1-(1,1-dimethylethyl)-3,4-dimethyl-)	38066-25-0	**	8.05 (V)	PE	5618
$C_{10}H_{17}P^+$	$C_4H_9(CH_3)_2PC_4H_9$ (1H-Phosphole, 1-butyl-3,4-dimethyl-)	30540-39-7	**	8.15 (V)	PE	5618
$C_{10}H_{21}P^+$	$(n-C_4H_9)_2PCH=CH_2$	13652-22-7	**	8.25 (V)	PE	4423
$C_{11}H_{23}P^+$	$(n-C_4H_9)_2PCH_2CH=CH_2$	56660-54-9	**	8.20 (V)	PE	4423
$C_{12}H_{11}P^+$	$(C_6H_5)_2PH$ (Phosphine, diphenyl-)	829-85-6	**	7.80 ± 0.01	PE	4154
$C_{12}H_{13}P^+$	$C_6H_5C_6H_5P(CH_3)_2$ (1H-Phosphole, 2,5-dimethyl-1-phenyl-)	13904-58-0	**	8.0 (V)	PE	4090
$C_{12}H_{17}P^+$	$C_6H_5C_6H_5P(CH_3)_2$ (Phospholane, 2,5-dimethyl-1-phenyl-) $(CH_3)_3P=CHCH=CHC_6H_5$ (Phosphorane, trimethyl(3-phenyl-2-propenyldene)-(E)-)	40358-68-7 61169-16-2	** **	8.35 (V) 6.20 (V)	PE PE	4090 4579

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{12}H_{27}P^+$	$(n-C_3H_7)_3P$	998-40-3	**	8.00 (V)	PE	4423
	$(tert-C_3H_7)_3P$	13716-12-6	**	7.70 (V)	PE	4474
$C_{13}H_9P^+$	$C_{13}H_9P$	398-14-1	**	7.34 (V)	PE	5436
	(Acridophosphine)					
$C_{14}H_{11}P^+$	$C_{13}H_8PCH_3$	57422-79-4	**	7.19 (V)	PE	5436
	(Acridophosphine, 10-methyl)					
$C_{14}H_{15}P^+$	$(C_6H_5)_2(CH_3)P=CH_2$	4554-22-7	**	6.70 (V)	PE	4579
	(Phosphorane, methylmethylenediphenyl-)					
$C_{14}H_{23}P^+$	$C_6H_5(P(n-C_4H_9)_2)$	6372-44-7	**	8.03 (V)	PE	4423
	(Phosphine, dibutylphenyl-)					
$C_{15}H_{11}P^+$	$C_9H_6PC_6H_5$	39768-04-2	**	7.65	PE	4066
	(Phosphinoline, 2-phenyl-)					
$C_{15}H_{25}P^+$	$C_6H_5(CH_2P(n-C_4H_9)_2)$	56660-53-8	**	8.09 (V)	PE	4423
	(Phosphine, dibutyl(phenylmethyl)-)					
$C_{17}H_{29}P^+$	$C_5H_2P(C(CH_3)_3)_3$	17420-29-0	**	8.0 (V)	PE	3934
	(Phosphorin, 2,4,6-tris(1,1-dimethylethyl)-)					
$C_{18}H_{15}P^+$	$(C_6H_5)_3P$	603-35-0	**	7.44 ± 0.05	PI	4325
	(Phosphine, triphenyl-)		**	7.37 ± 0.01	PE	4154
			**	7.80 (V)	PE	4579
			**	7.85 ± 0.05 (V)	PE	4368
			**	7.92 (V)	PE	5438
			**	7.97 (V)	PE	5139
$C_{18}H_{27}P^+$	$C_6H_5P(C_6H_{11})_2$	6476-37-5	**	7.94 (V)	PE	5417
	(Phosphine, dicyclohexylphenyl-)					
$C_{18}H_{33}P^+$	$(C_6H_{11})_3P$	2622-14-2	**	7.75 (V)	PE	5139
	(Phosphine, tricyclohexyl-)					
$C_{19}H_{13}P^+$	$C_{13}H_8PC_6H_5$	20995-81-7	**	7.25 (V)	PE	5436
	(Acridophosphine, 10-phenyl-)		**	7.25 (V)	PE	5630
	$C_{13}H_8PC_6H_5$	52731-68-7	**	7.60 (V)	PE	4262
	(Phosphanthridine, 6-phenyl-)					
$C_{19}H_{17}P^+$	$(C_6H_5)_3P=CH_2$	3487-44-3	**	6.62 (V)	PE	4579
	(Phosphorane, methylenetriphenyl-)					
$C_{20}H_{19}P^+$	$(C_6H_5)_3P=CHCH_3$	1754-88-7	**	6.15 (V)	PE	4579
	(Phosphorane, ethylenetriphenyl-)					

Ion	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{21}H_{21}P^+$	$(CH_3C_6H_4)_3P$ (Phosphine, tris(2-methylphenyl)-)	6163-58-2	**	7.64 (V)	PE	5438
	$(CH_3C_6H_4)_3P$ (Phosphine, tris(3-methylphenyl)-)	6224-63-1	**	7.68 (V)	PE	5438
	$(CH_3C_6H_4)_3P$ (Phosphine, tris(4-methylphenyl)-)	1038-95-9	**	7.6 (V)	PE	5438
	$(C_6H_5)_3P = C(CH_3)_2$ (Phosphorane, (1-methylethylidene)triphenyl-)	16666-80-1	**	6.04 (V)	PE	4579
$C_{22}H_{21}P^+$	$(C_6H_5)_3P = CHCH = CHCH_3$ (Phosphorane, 2-butenylidenetriphenyl-(E)-)	56374-57-3	**	5.95 (V)	PE	4579
	$C_5H_2P(C_6H_5)_3$ (Phosphorin, 2,4,6-triphenyl)	13497-36-4	**	7.80 (V)	PE	5271
$C_{23}H_{19}P^+$	$(C_6H_5)_3P = C_5H_4$ (Phosphorane, 2,4-cyclopentadien-1-ylidenetriphenyl-)	2224-32-0	**	6.91 (V)	PE	4579
$C_{25}H_{21}P^+$	$(C_6H_5)_3P = CHC_6H_5$ (Phosphorane, triphenyl(phenylmethylene)-)	16721-45-2	**	6.01 (V)	PE	4579
$C_{25}H_{23}P^+$	$C_5H_2P(C_6H_5)_3(CH_3)_2$ (Phosphorin, 1,1-dihydro-1,1-dimethyl-2,4,6-triphenyl-)	25959-36-8	**	5.90 (V)	PE	5271
$C_{27}H_{33}P^+$	$(iso-C_6H_7-C_6H_4)_3P$ (Phosphine, tris[4-(1-methylethyl)phenyl]-)	29949-82-4	**	7.53 (V)	PE	5438
$C_{29}H_{25}P^+$	$C_9H_6P(C_6H_5)(CH_2C_6H_5)_2$ (Phosphinoline, 1,1-dihydro-2-phenyl-1,1-bis(phenylmethyl)-)	39767-95-8	**	6.00	PE	4066
$C_{30}H_{39}P^+$	$(tert-C_4H_9C_6H_4)_3P$ (Phosphine, tris[4-(1,1-dimethylethyl)phenyl]-)	54409-77-7	**	7.52 (V)	PE	5438
$C_{35}H_{27}P^+$	$C_5H_2P(C_6H_5)_5$ (Phosphorin, 1,1-dihydro-1,1,2,4,6-pentaphenyl-)	22605-15-8	**	5.90 (V)	PE	5271
$C_4H_{12}P_2^+$	$((CH_3)_2P)_2-trans$	3676-91-3	**	7.88 (V)	PE	4191
			**	7.88 (V)	PE	4185
	$((CH_3)_2P)_2-gauche$	3676-91-3	**	8.79 (V)	PE	4185
$C_{10}H_{16}P_2^+$	$C_6H_4(P(CH_3)_2)_2$ (Phosphine, 1,4-phenylenebis(dimethyl)-)	10498-57-4	**	8.2 (V)	PE	5382
$C_{16}H_{36}P_4^+$	$(tert-C_4H_9P)_4$ (Tetraphosphetane, tetrabutyl-)	13969-03-4	**	7.39 (V)	PE	4942
$C_{24}H_{44}P_4^+$	$(C_6H_{11}P)_4$ (Tetraphosphetane, tetracyclohexyl-)	3040-71-9	**	7.28 (V)	PE	4942

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_5H_{15}P_5^+$	$(CH_3P)_5$ (Pentaphospholane, pentamethyl-)	1073-98-9	**	7.58 (V)	PE	4942
$C_{10}H_{25}P_5^+$	$(C_2H_5P)_5$ (Pentaphospholane, pentaethyl-)	4141-67-7	**	7.41 (V)	PE	4942
$C_{15}H_{35}P_5^+$	$(n-C_3H_7P)_5$ (Pentaphospholane, pentapropyl-)	55019-74-4	**	7.26 (V)	PE	4942
NP^+	NP	17739-47-8	**	11.85	PE	4498
$(^2\Sigma^+)$			**	11.88 ± 0.01	PE	4685
$(^2\Sigma^+)$			**	12.30 ± 0.01	PE	4685
$(^2\Pi)$			**	12.34	PE	4498
$(^2\Pi_\mu)$			**	15.74 ± 0.01	PE	4685
$(^2\Sigma^+)$			**			
$C_3H_{10}NP^+$	$(CH_3)_3P=NH$	15107-02-5	**	8.19 (V)	PE	4181
			**	8.29 (V)	PE	5442
$C_4H_{12}NP^+$	$(CH_3)_3PNCH_3$	42437-75-2	**	7.67 (V)	PE	5442
$C_7H_{18}NP^+$	$(CH_3)_3PN(tert-C_4H_9)$	71328-66-0	**	7.56 (V)	PE	5442
$C_9H_{14}NP^+$	$(CH_3)_3PNC_6H_5$ (Benzenamine, N-trimethylphosphoranylidene-)	57114-54-2	**	7.05 (V)	PE	5442
$C_{10}H_{16}NP^+$	$C_6H_4(N(CH_3)_2)(P(CH_3)_2)$ (Benzenamine, 4-(dimethylphosphino)-N,N-dimethyl-)	1199-66-2	**	7.30 (V)	PE	5382
$C_{18}H_{16}NP^+$	$(C_6H_5)_3PNH$ (Phosphine imide, P,P,P-triphenyl-)	2240-47-3	**	7.95 (V)	PE	5442
$C_{19}H_{18}NP^+$	$(C_6H_5)_3PNCH_3$ (Methanamine, N-(triphenylphosphoranylidene)-)	17986-01-5	**	7.54 (V)	PE	5442
$C_{20}H_{20}NP^+$	$(C_6H_5)_3PNC_2H_5$ (Ethanamine, N-triphenylphosphoranylidene-)	47182-04-7	**	7.43 (V)	PE	5442
$C_{20}H_{32}NP^+$	$(CH_3)_2NC_6H_4P(C_6H_{11})_2$ (Benzenamine, 4-(dicyclohexylphosphino)-N,N-dimethyl-)	40438-64-0	**	7.25 (V)	PE	5417
$C_{21}H_{22}NP^+$	$(C_6H_5)_3PN(iso-C_3H_7)$ (2-Propanamine, N-(triphenylphosphoranylidene)-)	40168-14-7	**	7.38 (V)	PE	5442
$C_{22}H_{24}NP^+$	$(C_6H_5)_3PN(tert-C_4H_9)$ (2-Propanamine, 2-methyl-N-(triphenylphosphoranylidene)-)	13989-64-5	**	7.35 (V)	PE	5442

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_2H_{20}NP^+$	$(C_6H_5)_3PNC_6H_5$ (Benzenamine, N-(triphenylphosphoranylidene)-)	2325-27-1	**	6.95 (V)	PE	5442
$C_2H_{26}NP^+$	$(C_6H_5)_3PNC_6H_{11}$ (Cyclohexanamine, N-(triphenylphosphoranylidene)-)	66949-28-8	**	7.37 (V)	PE	5442
$C_{31}H_{37}N_2P^+$	$C_5H_2P(C_6H_5)_3(N(C_2H_5)_2)_2$ (Phosphorin, 1,1-bis(diethylamino)-1,1-dihydro-2,4,6-triphenyl-)	36231-67-1	**	5.95 (V)	PE	5271
$C_6H_{16}N_3P^+$	$C_2H_4N_2P(CH_3)_2N(CH_3)_2$ (1,3,2-Diazaphospholidin-2-amine, N,N,1,3-tetramethyl-)	6069-38-1	**	7.61 (V)	PE	5477
$C_6H_{18}N_3P^+$	$((CH_3)_2N)_3P$	1608-26-0	**	7.30 (V)	PE	4474
			**	7.61 (V)	PE	3825
	$((CH_3)_2N)_3P_2(CO)_4Mo$	27342-90-1	**	10.01	PE	5602
				10.1±0.05	EI	3952
$C_8H_{18}N_3P^+$	$((CH_3)_2N)_3P_2(CO)_4Mo$	27342-90-1		10.1±0.05	EI	3952
$C_8H_{20}N_3P^+$	$C_2H_4N_2P(CH_3)_2N(C_2H_5)_2$ (1,3,2-Diazaphospholidin-2-amine, N,N,-diethyl-1,3-dimethyl)	65173-82-2	**	7.50 (V)	PE	5477
$C_{10}H_{24}N_3P^+$	$C_2H_4N_2P(CH_3)_2N(iso-C_3H_7)_2$ (1,3,2-Diazaphospholidin-2-amine, 1,3-dimethyl- N,N-bis(1-methylethyl)-)	65173-83-3	**	7.40 (V)	PE	5477
$C_{21}H_{30}N_3P^+$	$((CH_3)_2NC_6H_4)_3P$ (Benzenamine, 4,4',4''-phosphinidynetris[N,N-dimethyl-])	1104-21-8	**	6.9-7.0 (V)	PE	5438
$B_2C_6H_{18}N_3P^+$	$N_3B_2(CH_3)_4P(CH_3)_2$ (1,2,4,3,5-Triazadiborolidine, 1-(dimethylphosphino)-2,3,4,5-tetramethyl-)	53246-20-1	**	7.64 (V)	PE	4526
	$N_3B_2(CH_3)_4P(CH_3)_2$ (1,2,4,3,5-Triazadiborolidine, 4-(dimethylphosphino)-1,2,3,5-tetramethyl-)	53246-15-4	**	7.70 (V)	PE	4526
$B_2C_8H_{24}N_5P^+$	$C_6H_{24}B_2N_3P$ (Phosphonous diamide, N,N,N',N'-tetramethyl-P-(1,2,3,5-tetramethyl-1,2,4,3,5-triazaborolid in-4-yl)-) (RX $N_3B_2(CH_3)_4P(N(CH_3)_2)_2$)	53246-16-5	**	7.57 (V)	PE	4526
OP^+	PO	14452-66-5	**	8.231	S	3762
			**	8.373	S	5136
			**	8.38	S	3560
			**	8.5±1	EI	3819
			**	9.1±0.5	EI	4678
			**	9.5±0.5	EI	4098
			**	10.7	EI	4518
	P_2O_3	1314-24-5		13.5±1.0	EI	4098
	$(CH_3O)_3PO$	512-56-1	O + CH_3O + 2H	18.90±0.50	EI	3989
	$LaPO_4$	XXXXX-XX-X		11.5±0.5	EI	5603

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
O₂P⁺	PO ₂	12164-97-5	** ** **	10.5±0.1 10.5±1 11.5±0.5	EI EI EI	4518 3819 4098
	P ₂ O ₃	1314-24-5		15.4±1.0	EI	4098
	LaPO ₄	XXXXX-XX-X		10.4±0.5	EI	5603
O₃P₂⁺	P ₂ O ₃	1314-24-5	**	10.4±0.5	EI	4098
O₄P₂⁺	P ₂ O ₄	XXXXX-XX-X	**	10.8±1.0	EI	4098
O₅P₂⁺	P ₂ O ₅	1314-56-3	**	12.0±1.0	EI	4098
O₆P₃⁺	P ₃ O ₆	XXXXX-XX-X	**	12.3±1.0	EI	4098
O₇P₃⁺	P ₄ O ₉	XXXXX-XX-X		15.0±1.0	EI	4098
O₆P₄⁺	P ₄ O ₆ (2,4,6,8,9,10-Hexaoxa-1,3,5,7-tetraphosphatricyclo[3.3.1.1 ^{3,7}]decane)	10248-58-5	**	10.55 (V)	PE	5343
O₇P₄⁺	P ₄ O ₇	12065-80-4	**	11.4±0.5	EI	4098
O₈P₄⁺	P ₄ O ₈	12037-06-8	**	11.9±0.5	EI	4098
O₉P₄⁺	P ₄ O ₉	XXXXX-XX-X	**	12.4±0.5	EI	4098
O₁₀P₄⁺	P ₄ O ₁₀ (2,4,6,8,9,10-Hexaoxa-1,3,5,7-tetraphosphatricyclo[3.3.1.1 ^{3,7}]decane, 1,3,5,7-tetraoxide)	16752-60-6	** **	13.0±0.5 13.0±0.5	EI EI	4098 4098
CH₃OP⁺	(CH ₃ O) ₂ P(CH ₃ S)S	2953-29-9		13.40±0.30	EI	3989
C₂H₇OP⁺	(CH ₃) ₂ P(O)H	7211-39-4	**	10.32 (V)	PE	5523
C₃H₉OP⁺	(CH ₃) ₃ PO	676-96-0	** **	9.88 (V) 9.89 (V)	PE PE	5442 5368
			**	9.9	PE	5529
C₁₉H₂₉OP⁺	CH ₃ OC ₆ H ₄ P(C ₆ H ₁₁) ₂ (Phosphine, dicyclohexyl(4-methoxyphenyl)-)	40438-63-9	**	7.88 (V)	PE	5417
CH₃O₂P⁺	(CH ₃ O) ₃ PO	512-56-1	2HCHO + H	14.90±0.20	EI	3989
	(CH ₃ O) ₃ P(CH ₃ S)O	152-20-5	CH ₃ S + HCHO	12.25±0.20	EI	3989
	(CH ₃ O) ₂ P(CH ₃ S)S	2953-29-9	CH ₃ S + HCHS	12.75±0.20	EI	3989
	(CH ₃ S) ₂ P(CH ₃ O)O	22608-53-3	CH ₃ S + HCHS	11.90±0.10	EI	3989

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$\text{CH}_5\text{O}_2\text{P}^+$	$(\text{CH}_3\text{O})_3\text{PO}$	512-56-1	2HCHO	12.91 ± 0.10	EI	3989
	$(\text{CH}_3\text{O})_2\text{P}(\text{CH}_3\text{S})\text{O}$	152-20-5	HCHS + HCHO	12.35 ± 0.20	EI	3989
$\text{C}_2\text{H}_6\text{O}_2\text{P}^+$	$(\text{CH}_3\text{O})_2\text{P}(\text{CH}_3\text{S})\text{S}$	2953-29-9		10.40 ± 0.10	EI	3989
$\text{C}_6\text{H}_{11}\text{PO}_2^+$	$\text{PO}(\text{CH}=\text{CH}_2)_2(\text{OC}_2\text{H}_5)$	30594-15-1	**	10.23 (V)	PE	5021
$\text{C}_7\text{H}_{13}\text{PO}_2^+$	$\text{C}_7\text{H}_{13}\text{PO}_2$	71431-36-2	**	10.04 (V)	PE	5021
$\text{C}_{19}\text{H}_{35}\text{O}_2\text{P}^+$	$\text{C}_2\text{H}_5\text{P}(\text{OCH}_3)_2(\text{C}_4\text{H}_9)_3$ (Phosphorin, 2,4,6-tris(1,1-dimethylethyl)-1,1-dihydro-1,1-dimethoxy-)	37912-85-9	**	6.7 (V)	PE	4053
$\text{C}_{21}\text{H}_{31}\text{O}_2\text{P}^+$	$\text{C}_2\text{H}_5\text{COOC}_6\text{H}_4\text{P}(\text{C}_6\text{H}_{11})_2$ (Benzoic acid, 4-(dicyclohexylphosphino)-ethyl ester)	40438-59-3	**	8.12 (V)	PE	5417
$\text{C}_{23}\text{H}_{23}\text{O}_2\text{P}^+$	$\text{C}_2\text{H}_5\text{P}(\text{C}_6\text{H}_5)_2(\text{OCH}_3)_2$ (Phosphorin, 1,1-dihydro-1,1-dimethoxy-2,4,6-triphenyl-)	20995-67-9	**	6.60 (V)	PE	5271
$\text{CH}_4\text{O}_3\text{P}^+$	$(\text{CH}_3\text{O})_3\text{PO}$	512-56-1	HCHO + CH_3	13.90 ± 0.20	EI	3989
	$(\text{CH}_3\text{O})_2\text{P}(\text{CH}_3\text{S})\text{O}$	152-20-5	HCHS + CH_3	13.20 ± 0.20	EI	3989
$\text{C}_2\text{H}_6\text{O}_3\text{P}^+$	$(\text{CH}_3\text{O})_2\text{PO}$	31682-64-1	**	11.0 (V)	PE	5190
	$(\text{CH}_3\text{O})_3\text{PO}$	512-56-1	HCHO + H	14.1 ± 0.20	EI	3989
	$(\text{CH}_3\text{O})_2\text{P}(\text{CH}_3\text{S})\text{O}$	152-20-5	CH_3S	11.90 ± 0.10	EI	3989
$\text{C}_2\text{H}_7\text{O}_3\text{P}^+$	$\text{HPO}(\text{OCH}_3)_2$	868-85-9	**	10.53	PE	5032
	$(\text{CH}_3\text{O})_3\text{PO}$	512-56-1	HCHO	11.62 ± 0.10	EI	3989
	$(\text{CH}_3\text{O})_2\text{P}(\text{CH}_3\text{S})\text{O}$	152-20-5	HCHS	11.00 ± 0.10	EI	3989
$\text{C}_3\text{H}_7\text{O}_3\text{P}^+$	$\text{C}_2\text{H}_4\text{O}_2\text{P}(\text{OCH}_3)$ (1,3,2-Dioxaphospholane, 2-methoxy-)	XXXXX-XX-X	**	9.06 ± 0.1	PE	5042
$\text{C}_3\text{H}_9\text{O}_3\text{P}^+$	$\text{P}(\text{OCH}_3)_3$	121-45-9	**	8.50	PE	5516
			**	9.0 (V)	PE	5190
			**	9.21	PE	5602
			**	9.22 (V)	PE	4705
	$\text{CH}_3\text{PO}(\text{OCH}_3)_2$	756-79-6	**	10.00	PE	5032
$\text{C}_4\text{H}_7\text{O}_3\text{P}^+$	$\text{C}_4\text{H}_7\text{O}_3\text{P}$ (2,6,7-Trioxa-1-phosphabicyclo[2.2.2]octane)	280-45-5	**	9.42 ± 0.1	PE	5042
$\text{C}_4\text{H}_9\text{O}_3\text{P}^+$	$\text{C}_3\text{H}_6\text{O}_2\text{P}(\text{OCH}_3)$ (1,3,2-Dioxaphosphorinane, 2-methoxy-)	XXXXX-XX-X	**	8.74 ± 0.1	PE	5042
	$\text{PO}(\text{OCH}_3)_2(\text{CH}=\text{CH}_2)$	4645-32-3	**	10.94 (V)	PE	5021
$\text{C}_4\text{H}_{11}\text{O}_3\text{P}^+$	$\text{HPO}(\text{OC}_2\text{H}_5)_2$	762-04-9	**	10.31	PE	5032

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_5H_{11}O_3P^+$	$PO(OCH_3)_2(CH_2CH=CH_2)$	757-54-0	**	9.96 (V)	PE	5021
$C_6H_{13}O_3P^+$	$C_7H_4O_2P(CH_3)_2(OCH_3)$ (1,3,2-Dioxaphosphorinane, 2-methoxy-4,6-dimethyl-(2 α ,4 α ,6 α)-) $C_7H_4O_2P(CH_3)_2(OCH_3)$ (1,3,2-Dioxaphosphorinane, 2-methoxy-4,6-dimethyl-(2 β ,4 α ,6 α)-) $PO(OC_2H_5)_2(CH=CH_2)$	7735-82-2 41821-91-4 682-30-4	** ** ** **	8.34 \pm 0.1 8.69 \pm 0.1 10.6 (V) 10.6 (V)	PE PE PE PE	5042 5042 5021 5328
$C_6H_{15}O_3P^+$	$(C_2H_5O)_3P$	122-52-1	** ** **	8.8 (V) 8.92 (V) 9.15	PE PE PE	5190 4705 5602
$C_9H_{21}O_3P^+$	$(iso-C_3H_7O)_3P$	116-17-6	**	8.76 (V)	PE	5139
$C_{18}H_{15}O_3P^+$	$(C_6H_5O)_3P$ (Phosphorous acid triphenyl ester)	101-02-0	**	8.80 (V)	PE	5139
$C_{21}H_{21}O_3P^+$	$(CH_3OC_6H_4)_3P$ (Phosphine, tris(2-methoxyphenyl)-) $(CH_3OC_6H_4)_3P$ (Phosphine, tris(3-methoxyphenyl)-) $(CH_3OC_6H_4)_3P$ (Phosphine, tris(4-methoxyphenyl)-)	4731-65-1 29949-84-6 855-38-9	** ** **	7.37 (V) 7.72 (V) 7.48 (V)	PE PE PE	5438 5438 5438
$C_3H_8O_4P^+$	$(CH_3O)_3PO$	512-56-1	H	12.73 \pm 0.20	EI	3989
$C_3H_9O_4P^+$	$(CH_3O)_3PO$	512-56-1	** ** ** ** **	9.99 10.8 (V) 10.81 (V) 10.82 (V) 10.70 \pm 0.10	PE PE PE PE EI	5516 5190 5624 4705 3989
$C_6H_{15}O_4P^+$	$(C_2H_5O)_3PO$	78-40-0	** ** **	9.79 10.4 (V) 10.54 (V)	PE PE PE	5516 5190 5624
$H_6N_3OP^+$	$(NH_2)_3PO$	13597-72-3	**	10.00 \pm 0.05	EI	4759
$C_3H_{13}N_2OP^+$	$C_2H_4N_2P(CH_3)_2OCH_3$ (1,3,2-Diazapholidine, 2-methoxy-1,3-dimethyl-)	7137-86-2	**	8.12 (V)	PE	5477
$C_2H_{10}N_3OP^+$	$((CH_3)_2N)(NH_2)_2PO$	19316-37-1	**	8.85 \pm 0.05	EI	4759
$C_3H_{12}N_3OP^+$	$(CH_3NH)_3PO$	6326-72-3	**	9.10 \pm 0.05	EI	4759
$C_4H_{14}N_3OP^+$	$((CH_3)_2N)_2(NH_2)PO$ $((CH_3)_2N)(CH_3NH)_2PO$	3732-86-3 16853-36-4	** **	8.60 \pm 0.05 8.75 \pm 0.05	EI EI	4759 4759

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_5H_{16}N_3OP^+$	$((CH_3)_2N)_2(CH_3NH)PO$	10159-46-3	**	8.55 ± 0.05	EI	4759
$C_6H_{18}N_3OP^+$	$OP(N(CH_3)_2)_3$	630-31-9	**	7.82 (V)	PE	5624
	$((CH_3)_2N)_3PO$	680-31-9	**	8.7 (V)	PE	5190
			**	8.35 ± 0.05	EI	4759
$C_{18}H_{26}NO_2P^+$	$NO_2C_6H_4P(C_6H_{11})_2$ (Phosphine, dicyclohexyl(4-nitrophenyl)-)	40438-56-0	**	8.39 (V)	PE	5417
$C_2H_8N_2O_2P^+$	$OP(OC_2H_5)NHNH_2$	XXXXX-XX-X	**	7.95	PE	5627
$C_8H_{20}NO_3P^+$	$(N(C_2H_5)_2)PO(OC_2H_5)_2$	3167-69-9	**	8.69	PE	5032
$C_4H_{13}N_2O_3P^+$	$OP(OC_2H_5)_2NHNH_2$	56183-69-8	**	10.90 (V)	PE	5627
FP^+	PF_3	7783-55-3	2F	21.0 ± 0.3	EI	4543
	PF_2CN	14118-40-2	F + CN	19.1 ± 0.2	EI	4543
F_2P^+	PF_3	7783-55-3	F	13.5 ± 0.1	EI	4305
			F	15.4 ± 0.2	EI	4543
	P_2F_4	13824-74-3	PF_2	10.9 ± 0.1	EI	4305
	PF_2H	14984-74-8	H	11.7 ± 0.1	EI	4305
	PF_2CN	14118-40-2	CN	13.4 ± 0.2	EI	4543
	PF_2I	13819-11-9	I	10.8 ± 0.1	EI	4305
F_3P^+	PF_3	7783-55-3	**	11.5 ± 0.1	PI	4543
			**	11.56	PE	5453
			**	11.57 ± 0.01	PE	3703
			**	11.66 ± 0.01	PE	3641
			**	12.20 (V)	PE	5602
			**	12.23 ± 0.02 (V)	PE	3662
			**	12.28 (V)	PE	5539
			**	11.4 ± 0.2	EI	4543
			**	11.6 ± 0.1	EI	4305
			**	11.65	EI	5462
			**	11.72 ± 0.1	EI	3578
F_5P^+	PF_5	7647-19-0	**	15.54 (V)	PE	3872
			**	15.6 (V)	PE	3669
$F_4P_2^+$	P_2F_4	13824-74-3	**	9.64 (V)	PE	3662
			**	9.3 ± 0.1	EI	4305
HF_2P^+	PF_2H	14984-74-8	**	11.0 ± 0.1 (V)	PE	3662
			**	10.5 ± 0.1	EI	4305
$H_3BF_3P^+$	$(PF_3)(BH_3)$	14931-39-6	**	11.02 ± 0.03	PE	3699

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
H₃B₃F₃P⁺	B ₃ H ₇ PF ₃	11126-95-7		10.8±0.3	EI	3652
CFP⁺ (² Π)	FC≡P	65756-42-5	**	10.57±0.01	PE	4836
C₃F₉P⁺	(CF ₃) ₃ P	432-04-2	** ** **	11.70 (V) 11.70 (V) 11.70 (V)	PE PE PE	4191 4371 4261
C₄F₁₂P₂⁺	((CF ₃) ₂ P) ₂ - <i>trans</i>	2714-60-5	** **	10.71 (V) 10.71 (V)	PE PE	4191 4185
	((CF ₃) ₂ P) ₂ - <i>gauche</i>		**	11.57 (V)	PE	4185
C₆F₁₂P₂⁺	C ₂ P ₂ (CF ₃) ₄ (1,2-Diphosphete, 1,2-dihydro-1,2,3,4-tetrakis(trifluoromethyl)-)	2375-86-2	**	10.97 (V)	PE	4191
C₆F₁₅P₃⁺	(C ₂ F ₅ P) ₃ (Tetraphosphirane, tris(pentafluoroethyl)-)	29634-17-1	**	10.39 (V)	PE	4942
C₄F₁₂P₄⁺	P ₄ (CF ₃) ₄ (Tetraphosphetane, tetrakis(trifluoromethyl)-)	393-02-2	** **	10.18 (V) 10.18 (V)	PE PE	4191 4942
C₈F₂₀P₄⁺	(C ₂ F ₅ P) ₄ (Tetraphosphetane, tetrakis(pentafluoroethyl)-)	35449-91-3	**	9.99 (V)	PE	4942
C₃F₁₅P₅⁺	P ₅ (CF ₃) ₅ (Pentaphospholane, pentakis(trifluoromethyl)-)	745-23-3	** **	9.71 (V) 9.79 (V)	PE PE	4191 4942
C₂H₆FP⁺	(CH ₃) ₂ PF	507-15-3	**	9.35 (V)	PE	4474
C₈H₁₈FP⁺	<i>tert</i> -C ₄ H ₉) ₂ PF	29146-24-5	**	8.50 (V)	PE	4474
CH₃F₂P⁺	CH ₃ PF ₂	753-59-3	**	10.35 (V)	PE	4474
C₄H₉F₂P⁺	<i>tert</i> -C ₄ H ₉ PF ₂	29149-32-4	**	9.65 (V)	PE	4474
C₅H₅F₂P⁺	C ₅ H ₅ (PF ₂) (Phosphonous difluoride, 2,4-cyclopentadien-1-yl-)	36917-22-3	**	9.2 (V)	PE	4373
C₂₃H₁₇F₂P⁺	C ₅ H ₂ P(C ₆ H ₅) ₃ F ₂ (Phosphorin, 1,1-difluoro-1,1-dihydro-2,4,6-triphenyl-)	40425-79-4	**	7.15 (V)	PE	5271
CH₂F₃P⁺	H ₂ PCF ₃	420-52-0	** **	11.15±0.05 (V) 11.18 (V)	PE PE	5419 4371

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{18}H_{12}F_3P^+$	(FC ₆ H ₄) ₃ P (Phosphine, tris(3-fluorophenyl)-)	23039-94-3	**	8.32 (V)	PE	5438
	(FC ₆ H ₄) ₃ P (Phosphine, tris(4-fluorophenyl)-)	18437-78-0	**	8.12 (V)	PE	5438
$C_2HF_6P^+$	(CF ₃) ₂ PH	460-96-8	**	11.50 (V)	PE	4371
			**	11.51 (V)	PE	4185
$C_{21}H_{12}F_9P^+$	(CF ₃ C ₆ H ₄) ₃ P (Phosphine, tris[2-(2-trifluoromethyl)phenyl]-)	25688-42-0	**	8.30 (V)	PE	5438
	(CF ₃ C ₆ H ₄) ₃ P (Phosphine, tris(4-trifluoromethyl)phenyl)-)	13406-29-6	**	8.65 (V)	PE	5438
$C_1H_6F_6P_2^+$	(CH ₃) ₂ PP(CF ₃) ₂	666-62-6	**	9.37 (V)	PE	4191
$NF_5P_2^+$	PF ₂ (NPF ₃)	34118-39-3	**	11.2 (V)	PE	5398
$NF_6P_3^+$	(F ₂ P) ₃ N	56564-56-8	**	11.2±0.1 (V)	PE	4378
$N_3F_6P_3^+$	N ₃ P ₃ F ₆	XXXXX-XX-X	**	11.4	PE	5295
$H_2NF_2P^+$	F ₂ PNH ₂	25757-74-8	**	10.9±0.1 (V)	PE	4378
			**	10.9 (V)	PE	3662
$H_5N_2F_2P^+$	PHF ₂ (NH ₂) ₂	60448-09-1	**	10.7 (V)	PE	4622
$HNF_4P_2^+$	(F ₂ P) ₂ NH	34326-59-5	**	11.3±0.1 (V)	PE	4378
$HNF_6P_2^+$	NH(PF ₂)(PF ₄)	71481-55-5	**	11.6 (V)	PE	5398
$HBNF_4P^+$	BF ₂ [NH(PF ₂)]	60073-67-8	**	11.5±0.1 (V)	PE	4504
$CNFP^+$	PF ₂ CN	14118-40-2	F	15.7±0.2	EI	4543
CNF_2P^+	PF ₂ CN	14118-40-2	**	11.9±0.1 (V)	PE	3662
			**	11.7±0.2	EI	4543
$C_{27}H_{27}NFP^+$	C ₅ H ₅ P(C ₆ H ₅) ₃ (N(C ₂ H ₅) ₂)F (Phosphorin, 1-(diethylamino)-1-fluoro-1,1-dihydro-2,4,6-triphenyl-)	40425-24-9	**	6.50 (V)	PE	5271
$C_4H_{12}N_2FP^+$	((CH ₃) ₂ N) ₂ PF	1735-82-6	**	8.18 (V)	PE	3825
$C_2H_6NF_2P^+$	(CH ₃) ₂ NPF ₂	814-97-1	**	9.58 (V)	PE	3825
			**	9.6 (V)	PE	3662
			**	9.60 (V)	PE	4474

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$\text{C}_2\text{H}_6\text{NF}_2\text{P}^+$	$(\text{CH}_3)_2\text{NPF}_2$	814-97-1	**	10.2 ± 0.3	EI	3652
$\text{C}_3\text{H}_{10}\text{NF}_2\text{P}^+$	$(\text{C}_2\text{H}_5)_2\text{NPF}_2$	363-84-8	**	9.45 (V)	PE	4474
$\text{C}_6\text{H}_{18}\text{N}_3\text{F}_2\text{P}^+$	$((\text{CH}_3)_2\text{N})_3\text{PF}_2$	7549-83-9	**	8.04 (V)	PE	3825
$\text{C}_3\text{H}_{12}\text{N}_2\text{F}_3\text{P}^+$	$((\text{CH}_3)_2\text{N})_2\text{PF}_3$	1735-83-7	**	8.84 (V)	PE	3825
$\text{C}_2\text{H}_6\text{NF}_4\text{P}^+$	$(\text{CH}_3)_2\text{NPF}_4$	2353-98-2	**	10.35 (V)	PE	3825
$\text{C}_3\text{H}_6\text{NF}_6\text{P}^+$	$(\text{CH}_3)_2\text{NP}(\text{CF}_3)_2$	432-01-9	**	9.56 (V)	PE	4261
$\text{CH}_3\text{NF}_4\text{P}_2^+$	$\text{CH}_3\text{N}(\text{PF}_2)_2$	17648-18-9	**	10.95 (V)	PE	5376
$\text{C}_2\text{H}_6\text{N}_2\text{P}_2\text{F}_6^+$	$(\text{CH}_3\text{NPF}_3)_2$ (1,3,2,4-Diazadiphosphetidine, 2,2,2,4,4,4-hexafluoro-2,2,4,4-tetrahydro-1,3-dimethyl-)	3880-04-4	**	9.80	EI	5462
$\text{C}_{24}\text{H}_{20}\text{N}_3\text{F}_2\text{P}_3^+$	$(\text{C}_6\text{H}_5)_4\text{P}_3\text{N}_3\text{F}_2$ (1,3,5,2,4,6-Triazatriphosphorine, 2,4-difluoro-2,2,4,4,6,6-hexahydro-2,4,6,6-tetraphenyl-)	73502-98-4	**	8.59	PE	5443
$\text{C}_{12}\text{H}_{10}\text{N}_3\text{F}_4\text{P}_3^+$	$(\text{C}_6\text{H}_5)_3\text{P}_3\text{N}_3\text{F}_4$ (1,3,5,2,4,6-Triazatriphosphorine, 2,2,4,6-tetrafluoro-2,2,4,4,6,6-hexahydro-4,4-diphenyl-)	XXXXXX-XX-X	**	9.64 (V)	PE	5443
$\text{C}_{12}\text{H}_{10}\text{N}_3\text{F}_4\text{P}_3^+$	<i>cis</i> -(C_6H_5) ₃ $\text{P}_3\text{N}_3\text{F}_4$ (1,3,5,2,4,6-Triazatriphosphorine, 2,2,4,6-tetrafluoro-2,2,4,4,6,6-hexahydro-4,6-diphenyl-)	73502-97-3	**	9.62 (V)	PE	5443
$\text{C}_6\text{H}_5\text{N}_3\text{F}_3\text{P}_3^+$	$\text{C}_6\text{H}_5\text{P}_3\text{N}_3\text{F}_3$ (1,3,5,2,4,6-Triazatriphosphorine, 2,2,4,4,6-pentafluoro-2,2,4,4,6,6-hexahydro-6-phenyl-)	2713-48-6	**	10.07 (V)	PE	5443
$\text{C}_8\text{H}_{10}\text{N}_4\text{F}_3\text{P}_3^+$	$(\text{C}_6\text{H}_4\text{N}(\text{CH}_3)_2\text{P}_3\text{N}_3\text{F}_3$ (1,3,5,2,4,6-Triazatriphosphorine, 2-[4-(dimethylamino)phenyl]-2,4,4,6,6-pentafluoro-2,2,4,4,6,6-hexahydro-)	53968-86-8	**	7.88 (V)	PE	5443
$\text{BC}_2\text{H}_9\text{NF}_2\text{P}^+$	$(\text{CH}_3)_2\text{NF}_2\text{PBH}_3?$	2851-73-2	**	12.2 ± 0.3	EI	3652
$\text{B}_3\text{C}_2\text{H}_{11}\text{NF}_2\text{P}^+$	$(\text{CH}_3)_2\text{NF}_2\text{PB}_3\text{H}_7$	11126-93-5		10.4 ± 0.3	EI	3652
$\text{B}_3\text{C}_2\text{H}_{12}\text{NF}_2\text{P}^+$	$(\text{CH}_3)_2\text{NF}_2\text{PB}_3\text{H}_7$	11126-93-5	H	10.5 ± 0.3	EI	3652
$\text{B}_4\text{C}_2\text{H}_{12}\text{NF}_2\text{P}^+$	$(\text{CH}_3)_2\text{NF}_2\text{PB}_3\text{H}_8$	12602-24-3		10.0 ± 0.3	EI	3652

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
B₁C₂H₁₁NF₂P⁺	(CH ₃) ₂ NF ₂ PB ₃ H ₈	12602-24-3	**	9.6±0.3	EI	3652
OF₃P⁺	POF ₃	13478-20-1	**	12.77±0.04	PE	3641
OF₄P₂⁺	PF ₂ OPF ₂	13812-07-2	**	11.2 (V)	PE	3662
CH₃O₂F₂P⁺	PF ₂ O(OCH ₃)	22382-13-4	**	12.64 (V)	PE	4699
C₆H₆O₃F₉P⁺	(CF ₃ CH ₂ O) ₃ P	370-69-4	**	10.37 (V)	PE	4705
CNOF₂P⁺	PF ₂ NCO	461-59-6	**	11.05±0.02 (V)	PE	3662
C₅H₁₂N₂OF₂P⁺	CN ₂ P(=O)F(CH ₃) ₃ (1,3,2-Diazaphosphetidin-4-one, 2-fluoro-2,2-dihydro- 1,2,2,3-tetramethyl-)	32707-18-9	**	8.70±0.1	EI	5462
C₄H₉N₂OF₂P⁺	CN ₂ P(=O)F ₂ (CH ₃) ₃ (1,3,2-Diazaphosphetidin-4-one, 2,2-difluoro-2,2-dihydro- 1,2,3-trimethyl-)	31053-08-4	**	9.00±0.1	EI	5462
C₅H₁₁N₂OF₂P⁺	CN ₂ P(=O)F ₂ (CH ₃) ₂ C ₂ H ₅ (1,3,2-Diazaphosphetidin-4-one, 2-ethyl-2,2-difluoro- 2,2-dihydro-1,3-dimethyl-)	31053-09-5	**	8.90±0.1	EI	5462
C₉H₁₁N₂OF₂P⁺	C ₆ H ₅ CN ₂ P(=O)F ₂ (CH ₃) ₂ (1,3,2-Diazaphosphetidin-4-one, 2,2-difluoro-2,2- dihydro-1,2-dimethyl-3-phenyl-)	31053-06-2	**	8.15±0.1	EI	5462
C₉H₉F₂CN₂P(=O)(CH₃)₂	(1,3,2-Diazaphosphetidin-4-one, 2,2-difluoro-2,2-dihydro- 1,3-dimethyl-2-phenyl-)	32707-15-6	**	8.80±0.1	EI	5462
C₁₀H₁₃N₂OF₂P⁺	C ₁₀ H ₁₃ N ₂ OF ₂ P (1,3,2-Diazaphosphetidin-4-one, 2-ethyl-2,2-difluoro- 2,2-dihydro-1-methyl-3-phenyl-)	31053-07-3	**	8.00±0.1	EI	5462
C₇H₁₆N₃OF₂P⁺	C ₇ H ₁₆ N ₃ OF ₂ P (1,3,2-Diazaphosphetidin-4-one, 2-(diethylamino)-2,2- difluoro-2,2-dihydro-1,3-dimethyl-)	32707-17-8	**	8.85±0.1	EI	5462
C₃H₆N₂OF₃P⁺	CN ₂ P(=O)F ₃ (CH ₃) ₂ (1,3,2-Diazaphosphetidin-4-one, 2,2,2-trifluoro- 2,2-dihydro-1,3-dimethyl-)	32707-12-3	**	9.60±0.1	EI	5462
ONaP⁺	NaPO	56730-08-6	**	7.7±0.5	EI	4518
O₂NaP⁺	NaPO ₂ NaPO ₂	XXXXX-XX-X XXXXX-XX-X	** **	5.3±0.5 8.6	EI EI	4518 4098

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
O₃NaP⁺	NaPO ₃	XXXXX-XX-X **		10.16±0.04 (V)	PE	4840
	NaPO ₄	XXXXX-XX-X **		5.0±0.8	EI	4518
SiP⁺	PSi	12137-64-3	**	9.1±0.5	EI	4102
Si₂P⁺	PSi ₂	37347-46-9	**	8.4±0.5	EI	4102
SiP₂⁺	P ₂ Si	12137-68-7	**	9.0±0.5	EI	4102
H₅SiP⁺	SiH ₃ PH ₂	14616-47-8	**	9.9±0.1 (V)	PE	3661
H₉Si₃P⁺	(SiH ₃) ₃ P	15110-33-5	**	9.3±0.1 (V)	PE	3661
CSiP⁺	CSiP	37342-74-8	**	8.9±0.5	EI	4102
C₇H₁₉SiP⁺	(CH ₃) ₃ P = CHSi(CH ₃) ₃	3272-86-4	** ** **	6.80 6.81 (V) 6.81 (V)	PE PE PE	3782 4181 5368
C₂₂H₂₅SiP⁺	(CH ₃) ₃ SiCH = P(C ₆ H ₅) ₃ (Phosphorane, triphenyl[(trimethylsilyl)methylene]-)	3739-97-7	**	6.71 (V)	PE	4579
C₉H₂₅Si₂P⁺	(CH ₃) ₃ SiSi(CH ₃) ₂ CH = P(CH ₃) ₃	29947-67-9	** **	6.85 (V) 6.87	PE PE	4181 3782
C₁₀H₂₇Si₂P⁺	((CH ₃) ₃ Si) ₂ C = P(CH ₃) ₃	3607-03-2	** **	6.92 (V) 6.92 (V)	PE PE	4181 5368
C₂₇H₃₉Si₃P⁺	((CH ₃) ₃ SiC ₆ H ₄) ₃ P (Phosphine, tris[4-trimethylsilyl]phenyl)-)	18848-96-9	**	7.67 (V)	PE	5438
C₁₄H₃₆Si₃P₂⁺	C ₂ Si ₃ (CH ₃) ₆ (=P(CH ₃) ₃) ₂ (Phosphorane, (1,1,2,2,4,4-hexamethyl-1,2,4-trisilacyclopentane-3,5-diylidene)bis(trimethyl-))	51685-13-3	**	6.11 (V)	PE	4181
C₆H₁₈NSiP⁺	(CH ₃) ₃ SiN = P(CH ₃) ₃	6063-72-5	** **	8.30 (V) 8.30 (V)	PE PE	4181 5442
C₂₁H₂₄NSiP⁺	(C ₆ H ₅) ₃ PNSi(CH ₃) ₃ (Silanamine, 1,1,1-trimethyl-N-(triphenylphosphoranylidene)-)	13892-06-3	**	8.05 (V)	PE	5442
C₁₁H₃₁NSi₂P₂⁺	C ₁₁ H ₃₁ NSi ₂ P ₂ ⁺	39980-56-8	**	6.18 (V)	PE	4181
H₂F₃SiP⁺	H ₂ PSiF ₃	51518-19-5	**	11.06±0.05 (V)	PE	5419

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
H₆NF₂SiP⁺	PF ₂ [N(SiH ₃) ₂]	71579-71-0	**	10.8 (V)	PE	4988
H₃NF₄P₂Si⁺	N(PF ₂) ₂ (SiH ₃)	71579-72-1	**	11.2 (V)	PE	4988
S⁺	S	7704-34-9	**	10.36	S	4864
			**	10.3±0.3	EI	3449
			**	10.4±0.3	EI	4486
			**	10.4±0.3	EI	4874
			**	10.5±0.3	EI	3616
			**	10.5±0.3	EI	4580
			**	10.5±0.3	EI	4864
			**	10.5	EI	4544
			**	~11±0.5	EI	3448
	S ₂	23550-45-0	S	13.5±0.5	EI	5229
	H ₂ S	7783-06-4	H ₂	13.5	EI	3967
	CS ₂	75-15-0		14.80±0.02	PI	4936
			CS	14.80±0.02	PI	5435
	(⁴ S _u)		CS	14.88±0.05	EI	4905
	(⁴ S _u)		CS(X ¹ Σ ⁺)	13.35	EI	4897
				13.40±0.08	EI	5242
			CS	15±1	EI	3812
			CS	17±1	EI	3812
	SO ₂	7446-09-5	SO	16.334	PE	5388
	(⁴ S _u) COS	463-58-1	CO	13.52±0.05	EI	4905
			CO	13.7	EI	3779
	SCl ₂	10545-99-0		13.0±0.2	EI	4287
S₂⁺	S ₂	23550-45-0	**	9.42±0.10	EI	3616
			**	9.8±0.3	EI	4874
			**	9.8±0.5	EI	3615
	(² Π _{g,1/2})		**	9.30	PE	5475
	(² Π _{g,3/2})		**	9.38±0.01	PE	4370
			**	9.55 (V)	PE	4550
	(² Π _{g,3/2})		**	9.56 (V)	PE	5475
	(⁴ Π _u)		**	11.28	PE	5475
	(⁴ Σ _g ⁺)		**	13.06	PE	5475
			**	9.36±0.02	EI	4920
			**	9.42±0.1	EI	4554
			**	9.8±0.3	EI	4486
			**	10.1±0.3	EI	5229
			**	9.38±0.03	OTH	5435
	CS ₂	75-15-0	C	16.82±0.02	PI	5435
				16.88±0.02	PI	4936
	C ₃ H ₆ S ₂ (1,3-Dithiolane)	4829-04-3	CH ₂ =CHCH ₃	10.7±0.1	EI	3598
	S ₂ F ₂	13709-35-8		17.6±0.4	EI	3738
S₈⁺	S ₈	10544-50-0	**	9.23 (V)	PE	3846
			**	9.40 (V)	PE	4411
HS⁺	H ₂ S	7783-06-4	H	14.4	EI	3967
			H	14.7±0.2	EI	4610
H₂S⁺	H ₂ S	7783-06-4	**	10.466±0.002	S	5060
	(² B ₁) (² A ₁)		**	12.777±0.005	S	5060

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
H₂S⁺						
(² B ₂)	H ₂ S	7783-06-4	**	14.643	S	5060
(² B ₁)			**	10.5	PI	5479
(² A ₁)			**	12.8	PI	5479
(² B ₂)			**	14.8	PI	5479
(² B ₁)			**	10.43	PE	4073
			**	10.43 (V)	PE	4276
(² B ₁)			**	10.47	PE	3719
(² A ₁)			**	12.752	PE	3515
(² A ₁)			**	12.78	PE	3719
(² B ₂)			**	14.78	PE	3719
(² A ₁)			**	22.0±0.2 (V)	PE	5269
(² A ₁)			**	22.2 (V)	PE	3719
(² A ₁)			**	23.3±0.2 (V)	PE	5269
			**	10.45	EI	3967
			**	10.56±0.05	EI	4610
H₃S⁺						
	C ₂ H ₅ SH	75-08-1		12.41.0.02	EI	3487
	(CH ₃) ₂ S	75-18-3		14.14±0.02	EI	3487
H₂S₂⁺						
	H ₂ S ₂	13465-07-1	**	10.01 (V)	PE	4276
HBS⁺						
(² Π)	HBS	14457-85-3	**	11.11±0.03	PE	3982
			**	11.12	PE	3871
(² Σ ⁺)			**	13.54±0.03	PE	3982
(² Σ ⁺)			**	15.83±0.1	PE	3982
H₉B₉S⁺						
	SB ₉ H ₉ (1-Thiadecaborane(9))	41646-56-4	**	10.3 (V)	PE	5324
H₁₁B₉S⁺						
	6-SB ₉ H ₁₁ (6-Thiadecaborane(11))	12447-77-7	**	9.8 (V)	PE	5324
H₁₁B₁₁S⁺						
	SB ₁₁ H ₁₁ (1-Thiadodecaborane(11))	56464-75-6	**	11.1 (V)	PE	5324
CS⁺						
	CS	2944-05-0	**	11.33±0.01	PI	4936
(² Σ _g ⁺)			**	11.33±0.01	PE	3691
			**	11.33±0.02	PE	3696
(² Σ _g ⁺)			**	11.33±0.02	PE	5208
(² Σ)			**	11.34±0.02	PE	3690
(² π)			**	12.78±0.02	PE	3690
(² π _u)			**	12.79±0.01	PE	3691
(² Π _u)			**	12.79±0.02	PE	5208
(² Σ)			**	15.83±0.02	PE	3690
(² Σ _u ⁺)			**	15.84±0.01	PE	3691
(² Σ _u ⁺)			**	18.00±0.01	PE	3691
(² Σ)			**	18.03±0.02	PE	3690
			**	11.0±0.03	EI	4920
			**	11.39±0.1	EI	4554
			**	11.39±0.10	EI	3616
	CS ₂	75-15-0	S ⁻	13.64±0.02	PI	4936
				15.75±0.02	PI	4936
			S	15.75±0.02	PI	5435
(² Σ ⁺)			S ⁻	13.90±0.1	EI	4905

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
CS⁺						
(²Σ ⁺)	CS ₂	75-15-0	S	15.94±0.07	EI	4905
				14.10±0.08	EI	5242
(²Σ ⁺ , ²Π)			S-(²P _u)	14.5	EI	4897
(²Σ ⁺)			S(²P _g)	14.7	EI	4897
			S	16.3±1	EI	3812
(²Σ ⁺)	COS	463-58-1	O	18.7±0.5	EI	4905
			O ⁻ ?	16.7	EI	3779
CS₂⁺						
(²Π _{g3/2})	CS ₂	75-15-0	**	10.0685±0.0020	S	5439
(²Π _{g1/2})			**	10.1230±0.0020	S	5439
(²Π _{u1/2u})			**	12.586	S	3573
(²Π _u)			**	12.713	S	5048
(²Π _{g3/2})			**	10.070±0.006	PI	5299
(²Π _{g3/2})			**	10.074±0.005	PI	4936
(²Π _{g3/2})			**	10.076±0.005	PI	5435
(²Π _g)			**	10.077	PI	4994
(²Π _{u1/2})			**	10.125	PI	5299
(²Π _{u1/2})			**	10.131±0.005	PI	4936
(²Π _{g1/2})			**	10.132±0.005	PI	5435
(²Π _u)			**	12.696	PI	4994
(²Σ ⁺)			**	14.479	PI	4994
(²Σ ⁺)			**	14.48±0.02	PI	5435
(²Σ ⁺)			**	14.480±0.005	PI	4936
(²Σ ⁺)			**	16.184±0.005	PI	4936
(²Σ ⁺)			**	16.19±0.02	PI	5435
(²Σ ⁺)			**	16.192	PI	4994
(²Σ ⁺)			**	16.53±0.02	PI	4936
(²Π _g)			**	10.06±0.01	PE	3965
			**	10.06	PE	3697
(²Π _{g3/2})			**	10.06	PE	4073
(X²Π _{g3/2})			**	10.074.0.002	PE	4979
			**	10.079±0.003	PE	5256
			**	10.10 (V)	PE	5055
(²Π _u)			**	12.67±0.01	PE	3965
(²Σ ⁺)			**	14.47±0.01	PE	3965
(²Σ ⁺)			**	16.18±0.01	PE	3965
			**	10.06±0.025	EI	5027
			**	10.05±0.08	EI	5242
			**	10.07±0.1	EI	4554
			**	10.07±0.10	EI	3616
(²Π _u)			**	12.620	OTH	5029
C₂S₄⁺						
	(CS ₂) ₂	XXXXX-XX-X **		9.36±0.02	PI	5439
	(CS ₂) ₂	XXXXX-XX-X **		~9.63	PI	5299
C₃S₆⁺						
	(CS ₂) ₃	XXXXX-XX-X **		9.22±0.02	PI	5439
C₄S₈⁺						
	(CS ₂) ₄	XXXXX-XX-X **		9.10±0.02	PI	5439
C₅S₁₀⁺						
	(CS ₂) ₅	XXXXX-XX-X **		9.04±0.02	PI	5439
CHS⁺						
	C ₄ H ₄ S (Thiophene)	110-02-1	C ₃ H ₃	13.19±0.04	PE	5283
	C ₃ H ₆ S ₂ (1,3-Dithiolane)	4829-04-3	CHS + CH ₄ ?	13±0.4	EI	3598

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
CHS⁺	(CH ₃) ₂ SO	67-68-5	H ₂ O + CH ₃	11.55 ± 0.2	EI	5311
	C ₃ H ₆ OS (1,3-Oxathiolane)	2094-97-5		12.9 ± 0.2	EI	3598
CH₂S⁺	HCHS	865-36-1	**	9.0 (V)	PE	4467
			**	9.33 (V)	PE	4323
			**	9.338 ± 0.010	PE	3697
			**	9.38 (V)	PE	4680
	CH ₃ SH	74-93-1	H ₂	10.8 ± 0.1	PI	4025
	(CH ₃) ₂ S	75-18-3	CH ₄	10.46 ± 0.08	PI	4025
	(C ₂ H ₅) ₂ S	352-93-2	C ₂ H ₃ + CH ₄	11.75 ± 0.03	PI	4025
	C ₃ H ₆ S ₂ (1,3-Dithiolane)	4829-04-3		11 ± 0.4	EI	3598
	C ₃ H ₆ OS (1,3-Oxathiolane)	2094-97-5		12.5 ± 0.2	EI	3598
CH₃S⁺	CH ₃ SH	74-93-1	H	11.37 ± 0.05	PI	4025
	(CH ₃) ₂ S	75-18-3	CH ₃	10.79 ± 0.04	PI	4025
	(C ₂ H ₅) ₂ S	352-93-2	C ₂ H ₃ + CH ₃	12.00 ± 0.05	PI	4025
	(CH ₃ CH ₂) ₂ CHSH	616-31-9	C ₂ H ₅ + C ₂ H ₄	12.1	EI	5316
	CH ₃ SCH(CH ₃)C ₂ H ₅	10359-64-5	C ₂ H ₅ + C ₂ H ₄	12.9	EI	5316
	C ₃ H ₆ S ₂ (1,3-Dithiolane)	4829-04-3		11.4 ± 0.4	EI	3598
	C ₂ H ₅ SOCH ₃	1669-98-3	C ₂ H ₄ + OH	12.23 ± 0.32	EI	5311
	(CH ₃ O) ₂ P(CH ₃ S)O	152-20-5		13.1 ± 0.30	EI	3989
	(CH ₃ S) ₂ P(CH ₃ O)O	22608-53-3		12.60 ± 0.20	EI	3989
CH₄S⁺ (² A'')	CH ₃ SH	74-93-1	**	9.44 ± 0.01	PI	4025
			**	9.415	PE	3697
			**	9.42	PE	3678
			**	9.44	PE	4032
			**	9.44	PE	4087
			**	9.44 (V)	PE	3656
			**	9.44 (V)	PE	5632
C₂H₂S⁺	CH ₂ =C=S	18282-77-4	**	8.89 (V)	PE	4698
	C ₄ H ₄ S (Thiophene)	110-02-1	C ₂ H ₂	12.1 ± 0.1	PE	5283
C₂H₃S⁺	C ₃ H ₆ S ₂ (1,3-Dithiolane)	4829-04-3	CH ₃ S	10.8 ± 0.4	EI	3598
	C ₃ H ₆ OS (1,3-Oxathiolane)	2094-97-5	CH ₂ O + H	12.3 ± 0.1	EI	3598
C₂H₄S⁺	CH ₃ CHS	6851-93-0	**	8.98 ± 0.02 (V)	PE	4212
			**	9.3 (V)	PE	4467
			**	9.051 ± 0.006	S	3882
			**	8.9 ± 0.1	PE	4990
	C ₂ H ₄ S (Thiirane)	420-12-2	**	9.00	PE	3861
			**	9.05 (V)	PE	3837
			**	9.89 ± 0.3	PI	4025
			**	11.2 ± 0.3	EI	3598
	(C ₂ H ₅) ₂ S	352-93-2	C ₂ H ₆	9.89 ± 0.3	PI	4025
	C ₃ H ₆ S ₂ (1,3-Dithiolane)	4829-04-3	CH ₂ S	11.2 ± 0.3	EI	3598
	C ₃ H ₆ OS (1,3-Oxathiolane)	2094-97-5	CH ₂ O	10.5 ± 0.1	EI	3598

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_2H_5S^+$	$(CH_3)_2S$	75-18-3	H	10.93 ± 0.02	PI	4025
	$(CH_3)_2CHSH$	75-33-2	CH_3	11.0 ± 0.15	EI	5058
	$(C_2H_5)_2S$	352-93-2	C_2H_5	10.23 ± 0.03	PI	4025
	$HSCH_2CH_2SH$	26914-40-9	SH	10.4 ± 0.15	EI	5058
	$C_3H_6S_2$ (1,3-Dithiolane)	4829-04-3	CHS	11.4 ± 0.3	EI	3598
	$(CH_3S)_2CH_2$	1618-26-4	SCH_3	10.1 ± 0.15	EI	5058
	C_3H_6OS (1,3-Oxathiolane)	2094-97-5	CHO	10.4 ± 0.1	EI	3598
	$BrCH_2CH_2SH$	24276-77-5	Br	10.1 ± 0.15	EI	5058
$C_2H_6S^+$	C_2H_5SH	75-08-1	**	9.29	PE	4032
	$(CH_3)_2S$	75-18-3	**	8.687	S	4238
			**	8.706 ± 0.010	S	3970
			**	8.69 ± 0.01	PI	4025
			**	7.59 (V)	PE	5526
			**	8.5 ± 0.1	PE	4990
			**	8.57 ± 0.04	PE	3842
			**	8.65 (V)	PE	3678
			**	8.67	PE	3867
			**	8.67 (V)	PE	4276
			**	8.67 (V)	PE	5632
			**	8.7	PE	4104
			**	8.71 (V)	PE	3656
			**	8.71 (V)	PE	4884
			**	8.71 (V)	PE	5538
	$(C_2H_5)_2S$	352-93-2	C_2H_5	9.90 ± 0.03	PI	4025
C_3HS^+	C_4H_4S (Thiophene)	110-02-1	CH_3	12.95 ± 0.05	PE	5283
$C_3H_5S^+$	$C_3H_6S_2$ (1,3-Dithiolane)	4829-04-3	SH	10.5 ± 0.1	EI	3598
$C_3H_6S^+$	$CH_2=CHCH_2SH$	870-23-5	**	9.25	PE	3864
			**	9.25 (V)	PE	5427
	$CH_2=CHSCH_3$	1822-74-8	**	8.44 (V)	PE	4246
			**	8.45 (V)	PE	4291
			**	8.45 (V)	PE	4638
			**	8.45 (V)	PE	5632
	$(CH_3)_2CS$	4756-05-2	**	8.6 (V)	PE	4467
			**	8.60 ± 0.05 (V)	PE	4212
	C_3H_6S (Thietane)	287-27-4	**	8.65 ± 0.01	PI	5531
	$C_2H_5SCH_3$ (Thiirane, methyl-)	1072-43-1	**	8.88 (V)	PE	4747
$C_3H_7S^+$	$(CH_3)_3CSH$	75-66-1	CH_3	11.4 ± 0.15	EI	5316
	$(C_2H_5)_2S$	352-93-2	CH_3	10.16 ± 0.05	PI	4025
			CH_3	10.7 ± 0.15	EI	5316
	$(CH_3CH_2)_2CHSH$	616-31-9	C_2H_5	10.6 ± 0.15	EI	5316
	$CH_3SCH(CH_3)C_2H_5$	10359-64-5	C_2H_5	10.3 ± 0.15	EI	5316
	$BrCH_2CH_2CH_2SH$	XXXXX-XX-X	Br	9.5 ± 0.15	EI	5316
$C_3H_8S^+$	$C_2H_5SCH_3$	624-89-5	**	8.46	CTS	4272

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_3H_8S^+$	<i>n</i> -C ₃ H ₇ SH	107-03-9	**	9.19	PE	4032
	<i>iso</i> -C ₃ H ₇ SH	75-33-2	**	9.14	PE	4032
$C_4H_3S^+$	C_4H_4S (Thiophene)	110-02-1	H	12.93 ± 0.07	PE	5283
	C_4H_4S (Thiophene)	110-02-1	**	8.874 ± 0.005	S	3731
$C_4H_4S^+$	C_4H_4S (Thiophene)	110-02-1	**	8.86 ± 0.01	PI	4058
			**	8.85 (V)	PE	4690
			**	8.87 ± 0.01	PE	5283
			**	8.87 (V)	PE	3858
			**	8.90	PE	4017
			**	8.90 (V)	PE	5405
			**	~8.8	EI	4656
			**	8.80 ± 0.05	EI	4316
			**	9.05	CTS	3787
			**	9.12 ± 0.05	EI	3482
$C_4D_4S^+$	C_4D_4S (Thiophene- <i>d</i> ₄)	2036-39-7	**	8.874 ± 0.005	S	3731
	$(CH_2=CH)_2S$	627-51-0	**	8.25 ± 0.01	PI	5531
$C_4H_6S^+$	$C_2H_5SCH=CH_2$ (Thiirane, ethenyl-)	5954-75-6	**	7.61 (V)	PE	5526
	C_4H_6S (Thiophene, 2,5-dihydro-)	1708-32-3	**	8.89 (V)	PE	4747
	$CH_2=CHSC_2H_5$	627-50-9	**	8.54 (V)	PE	3995
	$CH_3SCH_2CH=CH_2$	10152-76-8	**	8.21 ± 0.01	PI	5531
$C_4H_8S^+$	C_4H_8S (Thiophene, tetrahydro-)	110-01-0	**	8.6	PE	4104
			**	8.65 (V)	PE	4211
			**	8.40 (V)	PE	3995
			**	8.42 (V)	PE	4145
			**	8.62 ± 0.05	EI	3498
			**	8.62	EI	5292
	$(C_2H_5)_2S$	352-93-2	H	10.2 ± 0.1	PI	4025
	$(C_2H_5)_2S$	352-93-2	**	8.42 ± 0.01	PI	4025
$C_4H_{10}S^+$			**	7.45 (V)	PE	5526
			**	8.44 (V)	PE	4276
			**	8.44 (V)	PE	5632
			**	8.41	CTS	4272
	<i>n</i> -C ₄ H ₉ SH	109-79-5	**	9.15	PE	4032
	<i>sec</i> -C ₄ H ₉ SH	513-53-1	**	9.10	PE	4032
	<i>iso</i> -C ₄ H ₉ SH	513-44-0	**	9.12	PE	4032
	<i>tert</i> -C ₄ H ₉ SH	75-66-1	**	9.03	PE	4032
	$C_4H_7SCH_3$ (Thiophene, 2-methyl-)	554-14-3	**	8.59 (V)	PE	5323

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_5H_6S^+$	$C_4H_3SCH_3$	554-14-3	**	8.63 ± 0.05	EI	3482
	$C_4H_3SCH_3$	616-44-4	**	8.61	CTS	3787
	$C_4H_3SCH_3$ (Thiophene, 3-methyl-)	616-44-4	**	8.72	EI	3787
	C_5H_6S	289-70-3	**	8.84	CTS	3787
	C_5H_6S	289-70-3	**	8.70 (V)	PE	5323
	C_5H_6S (4H-Thiopyran)	289-70-3	**	8.0 ± 0.1 (V)	PE	4841
$C_5H_{10}S^+$	$CH_2=CHS(iso-C_3H_7)$	18888-46-5	**	8.15 ± 0.01	PI	5531
	$CH_2=CHCH_2SC_2H_5$	5296-62-8	**	8.51 ± 0.01	PI	5531
	$CH_2=CHSC_3H_7$	16330-21-5	**	8.16 ± 0.01	PI	5531
	$C_5H_{10}S$	1613-51-0	**	8.39	PE	4246
	$C_5H_{10}S$ (2H-Thiopyran, tetrahydro-)	1613-51-0	**	8.45 (V)	PE	3733
$C_5H_{12}S^+$	$C_2H_5S(iso-C_3H_7)$	5145-99-3	**	8.35 ± 0.01	PI	5531
	$(CH_3)_3CSCH_3$	6163-64-0	**	8.38 ± 0.05	PE	4153
	$n-C_3H_7SC_2H_5$	4110-50-3	**	8.37	CTS	4272
$C_6H_4S^+$	$cis-C_2H_2S(C\equiv CH)_2$ (Thiirane, <i>cis</i> -2,3-diethynyl-)	50555-56-1	**	8.80	PE	4374
	$trans-C_2H_2S(C\equiv CH)_2$ (Thiirane, <i>trans</i> -2,3-diethynyl-)	50555-55-0	**	8.85	PE	4374
$C_6H_6S^+$	C_6H_5SH (Benzenethiol)	108-98-5	**	8.28	PE	3678
			**	8.39	PE	4621
			**	8.47 (V)	PE	4327
			**	8.95 ± 0.1	EI	3817
			**	8.36	CTS	4272
$C_6H_8S^+$	$C_4H_2S(CH_3)_2$ (Thiophene, 2,5-dimethyl-)	638-02-8	**	8.10	EI	3787
			**	8.18	CTS	3787
	$C_4H_3SC_2H_5$	872-55-9	**	8.67 ± 0.05	EI	3482
	$C_4H_3SC_2H_5$ (Thiophene, 2-ethyl-)	872-55-9	**	8.57	CTS	3787
$C_6H_{10}S^+$	$HC\equiv CS(iso-C_4H_9)$	50351-47-8	**	8.62 ± 0.01	PI	5531
	$(CH_2=CHCH_2)_2S$	592-88-1	**	8.52 ± 0.01	PI	5531
	$C_6H_{10}S$ (7-Thiabicyclo[2.2.1]heptane)	279-59-4	**	8.28 ± 0.04	PE	3842
	$C_5H_7SCH_3$ (2H-Thiopyran, 3,4-dihydro-6-methyl-)	13042-79-0	**	7.95 (V)	PE	4569
$C_6H_{12}S^+$	$CH_2=CHS(tert-C_4H_9)$	14094-13-4	**	8.07 ± 0.01	PI	5531
	$CH_2=CHSC_4H_9$	4789-70-2	**	8.15 ± 0.01	PI	5531
$C_6H_{14}S^+$	$(n-C_3H_7)_2S$	111-47-7	**	8.34 (V)	PE	4276
			**	8.34 (V)	PE	5632
	$(iso-C_3H_7)_2S$	625-80-9	**	8.25 ± 0.01	PI	5531
			**	8.26 (V)	PE	4276

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_6H_{11}S^+$	(iso-C ₃ H ₇) ₂ S	625-80-9	**	8.26 (V)	PE	5632
$C_7H_8S^+$	C ₆ H ₅ CH ₂ SH (Benzenemethanethiol)	100-53-8	**	8.85 (V)	PE	3678
	C ₆ H ₅ SCH ₃ (Benzene,(methylthio)-)	100-68-5	**	7.92±0.02	PI	5552
			**	7.96±0.01	PI	5531
			**	8.02 (V)	PE	4479
			**	8.04 (V)	PE	4884
			**	8.07 (V)	PE	3781
			**	8.07 (V)	PE	4327
			**	8.07 (V)	PE	5632
			**	8.60 (V)	PE	4327
			**	8.08	CTS	4272
			**	7.93	PE	4621
	C ₆ H ₄ (SH)CH ₃ (Benzenethiol, 2-methyl-)	137-06-4	**	8.31 (V)	PE	4327
	C ₆ H ₄ (SH)CH ₃ (Benzenethiol, 3-methyl-)	108-40-7	**	8.44 (V)	PE	4327
	C ₆ H ₄ (SH)CH ₃ (Benzenethiol, 4-methyl-)	106-45-6	**	8.33 (V)	PE	4327
	C ₇ H ₈ S (2-Thiabicyclo[3.2.1]octa-3,6-diene)	39066-37-0	**	8.03-8.12 (V)	PE	5481
$C_7H_{10}S^+$	C ₇ H ₁₀ S (2-Thiabicyclo[3.2.1]oct-3-ene)	71017-55-5	**	7.92 (V)	PE	5481
$C_7H_{12}S^+$	CH ₃ C≡CS(iso-C ₄ H ₉)	56444-80-5	**	8.15±0.01	PI	5531
	C ₇ H ₁₂ S (2-Thiabicyclo[3.2.1]octane)	279-81-2	**	8.43-8.52 (V)	PE	5481
	C ₅ H ₆ S(CH ₃) ₂ (2 <i>H</i> -Thiopyran, 3,4-dihydro-4,4-dimethyl-)	53520-28-8	**	8.06 (V)	PE	4246
$C_8H_6S^+$	C ₆ H ₄ C ₂ H ₂ S (Benzothiophene)	11095-43-5	**	8.13±0.015 (V)	PE	5522
	C ₈ H ₆ S (Benzo[<i>b</i>]thiophene)	95-15-8	**	8.20	PE	4017
			**	8.73±0.05	EI	4316
	C ₈ H ₆ S (Benzo[<i>c</i>]thiophene)	270-82-6	**	7.75	PE	4017
$C_8H_8S^+$	C ₆ H ₅ SCH=CH ₂ (Benzene,(ethenylthio)-)	1822-73-7	**	7.96±0.01	PI	5531
	C ₆ H ₅ CSCH ₃ (Ethanethione, 1-phenyl-)	16696-68-7	**	8.1 (V)	PE	4467
	C ₈ H ₈ S (9-Thiabicyclo[4.2.1]nona-2,4,7-triene)	35783-97-2	**	8.39 (V)	PE	4326
$C_8H_{10}S^+$	C ₆ H ₅ SC ₂ H ₅ (Benzene,(ethylthio)-)	622-38-8	**	7.88±0.02	PI	5531
			**	8.0 (V)	PE	4327
			**	8.53 (V)	PE	4327
	C ₆ H ₄ (CH ₃)SCH ₃ (Benzene, 1-methyl-3-(methylthio)-)	4886-77-5	**	8.00 (V)	PE	4327
			**	8.50 (V)	PE	4327

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_8H_{10}S^+$	$C_6H_5(CH_3)SCH_3$ (Benzene, 1-methyl-4-(methylthio)-)	623-13-2	**	7.87 (V)	PE	4327
			**	7.9 ± 0.05 (V)	PE	4389
			**	8.50 (V)	PE	4327
	$C_6H_5CH_2SCH_3$ (Benzene, [(methylthio)methyl]-)	766-92-7	**	9.01 (V)	PE	3781
	$C_8H_{10}S$ (9-Thiabicyclo[4.2.1]nona-2,4-diene)	50669-04-0	**	8.26 (V)	PE	4326
$C_8H_{12}S^+$	$C_4H_5S(tert-C_4H_9)$ (Thiophene, 2-(1,1-dimethylethyl)-)	1689-78-7	**	8.48	CTS	4382
			**	8.54 ± 0.05	EI	3482
	$C_4H_5S(tert-C_4H_9)$ (Thiophene, 3-(1,1-dimethylethyl)-)	1689-79-8	**	8.57	CTS	4382
	$C_8H_{12}S$ (9-Thiabicyclo[3.3.1]non-1-ene)	50436-33-4	**	8.35 (V)	PE	4569
	$C_8H_{12}S$ (9-Thiabicyclo[4.2.1]non-7-ene)	13350-64-6	**	8.20 (V)	PE	4326
	$C_4S(CH_3)_4$ (Thiophene, tetramethyl-)	14503-51-6	**	7.93	CTS	4382
$C_8H_{14}S^+$	$C_8H_{14}S$ (9-Thiabicyclo[3.3.1]nonane)	281-15-2	**	8.20 (V)	PE	4569
	$C_8H_{14}S$ (9-Thiabicyclo[4.2.1]nonane)	6522-54-9	**	8.16 (V)	PE	4326
$C_8H_{18}S^+$	$(n-C_4H_9)_2S$	544-40-1	**	8.22 (V)	PE	4276
	$(iso-C_4H_9)_2S$	592-65-4	**	8.32	CTS	4272
	$(tert-C_4H_9)_2S$	107-47-1	**	8.07 (V)	PE	4276
			**	8.07 (V)	PE	5632
			**	8.07 (V)	PE	5632
			**	8.18 ± 0.05 (V)	PE	4153
			**	8.19 ± 0.1	EI	4198
$C_9H_{10}S^+$	$C_6H_5CH=CHSCH_3$ (Benzene, [2-(methylthio)ethenyl]-(Z)-)	35822-50-5	**	7.75 (V)	PE	3781
			**	8.75 (V)	PE	5632
	$C_6H_5SCH_2CH=CH_2$ (Benzene, (2-propenylthio)-)	5296-64-0	**	7.91 ± 0.01	PI	5531
$C_9H_{11}S^+$	$C_6H_5S(tert-C_4H_9)$ (Benzene, [(1,1-dimethylethyl)thio]-)	3019-19-0	CH_3	12.1 ± 0.1	EI	4198
$C_9H_{12}S^+$	$C_6H_5S(n-C_3H_7)$ (Benzene, (propylthio)-)	874-79-3	**	7.81 ± 0.03	PI	5552
	$C_6H_5(CH_3)SC_2H_5$ (Benzene, 1-(ethylthio)-3-methyl-)	34786-24-8	**	7.92 (V)	PE	4327
			**	8.42 (V)	PE	4327
	$C_6H_5(CH_3)SC_2H_5$ (Benzene, 1-(ethylthio)-4-methyl-)	622-63-9	**	7.9 (V)	PE	4327
			**	8.45 (V)	PE	4327
	$C_6H_5SCH(CH_3)_2$ (Benzene, [(1-methylethyl)thio]-)	3019-20-3	**	8.46 (V)	PE	4327
$C_{10}H_8S^+$	$C_6H_5C_4H_5S$ (Thiophene, 2-phenyl)	825-55-8	**	8.06	CTS	4382

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₁₀H₁₄S⁺	C ₆ H ₅ S(<i>tert</i> -C ₃ H ₉) (Benzene, [(1,1-dimethylethyl)thio]-)	3019-19-0	**	8.38±0.05	PE	4589
			**	8.17±0.1	EI	4198
			**	8.40 (V)	PE	4327
	C ₆ H ₄ (CH ₃)SCH(CH ₃) ₂ (Benzene, 1-methyl-3-[(1-methylethyl)thio]-)	14905-80-7	**	8.38 (V)	PE	4327
	C ₆ H ₄ (CH ₃)SCH(CH ₃) ₂ (Benzene, 1-methyl-4-[(1-methylethyl)thio]-)	14905-81-8	**	8.38 (V)	PE	4327
C₁₀H₁₆S⁺	C ₇ H ₇ (=S)(CH ₃) ₃ (Bicyclo[2.2.1]heptane-2-thione, 1,3,3-trimethyl-)	875-06-9	**	8.41 (V)	PE	4323
	C ₆ H ₄ S(CH ₃) ₄ (Thiepin, 4,5-didehydro-2,3,6,7-tetrahydro-3,3,6,6-tetramethyl-)	26825-18-3	**	8.19 (V)	PE	4362
	C ₁₀ H ₁₅ SH (Tricyclo[3.3.1.1 ^{3,7}]decane-1-thiol)	34301-54-7	**	8.78 (V)	PE	5395
C₁₀H₂₀S⁺	C ₆ H ₈ S(CH ₃) ₄ (1-Thiacycloheptane, 3,3,6,6-tetramethyl-)	XXXXXX-XX-X	**	8.15 (V)	PE	4362
C₁₁H₁₀S⁺	C ₁₀ H ₇ SCH ₃ (Naphthalene, 1-(methylthio)-)	10075-72-6	**	7.67 (V)	PE	3781
	C ₁₀ H ₇ SCH ₃ (Naphthalene, 2-(methylthio)-)	7433-79-6	**	7.71 (V)	PE	3781
			**	7.71 (V)	PE	5632
C₁₁H₁₆S⁺	C ₆ H ₄ (SCH ₃)(<i>tert</i> -C ₄ H ₉) (Benzene, 1-(1,1-dimethylethyl)-4-(methylthio)-)	7252-86-0	**	7.83±0.05 (V)	PE	4627
	C ₆ H ₄ (CH ₃)SC(CH ₃) ₃ (Benzene, 1-[(1,1-dimethylethyl)thio]-3-methyl-)	34786-26-0	**	8.35 (V)	PE	4327
	C ₆ H ₄ (CH ₃)SC(CH ₃) ₃ (Benzene, 1-[(1,1-dimethylethyl)thio]-4-methyl-)	7439-10-3	**	8.31 (V)	PE	4327
C₁₂H₈S⁺	C ₁₂ H ₈ S (Dibenzothiophene)	132-65-0	**	7.90±0.03	PI	5552
			**	7.93 (V)	PE	5619
			**	8.01 (V)	PE	3852
			**	8.34	EI	3787
			**	8.44	EI	4228
			**	8.23	CTS	3787
C₁₂H₁₀S⁺	(C ₆ H ₅) ₂ S (Benzene,1,1'-thiobis-)	139-66-2	**	7.81±0.03	PI	5552
			**	7.92±0.01	PI	5531
			**	7.8	PE	4228
			**	7.86 (V)	PE	4667
			**	7.88±0.05	EI	3498
			**	7.88	EI	5292
			**	8.45±0.1	EI	3817
			**	8.04	CTS	4272
	C ₄ H ₅ SCH=CHC ₆ H ₅ (Thiophene, 2-(2-phenylethenyl)-)	3783-65-1	**	7.55	EI	3787
			**	7.78	CTS	3787
C₁₂H₁₈S⁺	C ₆ H ₆ (C ₂ H ₄ S)C ₆ H ₆ (4 α ,8 α -(Methanothiomethano)naphthalene,1,2,3,4,5,8-hexahydro-)	17853-64-4	**	8.07 (V)	PE	5194

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{12}H_{20}S^+$	$C_1H_2S(C_4H_9)_2$ (Thiophene, 2,5-bis(1,1-dimethylethyl)-)	1689-77-6	**	7.85 (V)	PE	4324
$C_{13}H_8S^+$	$C_{14}H_{12}S$ (Dibenzo[<i>b,e</i>]thiepin, 6,11-dihydro-)	1207-93-8	CH_3	10.80	EI	5414
$C_{13}H_{10}S^+$	$(C_6H_5)_2CH_2SC(=O)$ (Dibenz[<i>b,e</i>]thiepin-11(6H)-one)	1531-77-7	CO	9.75	EI	5340
$C_{13}H_{12}S^+$	$C_6H_5(CH_3)SC_6H_5$ (Benzene, 1-methyl-2-(phenylthio)-)	13963-35-4	**	8.01	CTS	4272
	$C_6H_5(CH_3)SC_6H_5$ (Benzene, 1-methyl-3-(phenylthio)-)	13865-48-0	**	7.99	CTS	4272
	$C_6H_5(CH_3)SC_6H_5$ (Benzene, 1-methyl-4-(phenylthio)-)	3699-01-2	**	7.95	CTS	4272
	$C_6H_5CH_2SC_6H_5$ (Benzene, [(phenylmethyl)thio]-)	831-91-4	**	7.87 ± 0.02	PI	5552
$C_{14}H_{10}S^+$	$C_{14}H_{10}S$ (Dibenzo[<i>b,f</i>] thiepin)	257-13-6	**	7.96 (V)	PE	4611
$C_{14}H_{11}S^+$	$C_{14}H_{12}S$ (Dibenzo[<i>b,e</i>]thiepin, 6,11-dihydro-)	1207-93-8	H	11.40	EI	5414
	$C_{13}H_8S(CH_3)_2$ (9H-Thioxanthene, 9,9-dimethyl-)	19019-10-4	CH_3	8.3 ± 0.1	EI	4664
$C_{14}H_{12}S^+$	$C_{14}H_{12}S$ (Dibenzo[<i>b,e</i>]thiepin, 6,11-dihydro-)	1207-93-8	**	8.77	EI	5414
$C_{14}H_{14}S^+$	$C_6H_5(CH_3)_2SC_6H_5$ (Benzene, 1,2-dimethyl-4-(phenylthio)-)	2828-65-1	**	7.89	CTS	4272
	$C_6H_5(CH_3)SC_6H_4CH_3$ (Benzene, 1,1'-thiobis[2-methyl-])	4537-05-7	**	7.94	CTS	4272
	$C_6H_5(CH_3)SC_6H_4CH_3$ (Benzene, 1,1'-thiobis[4-methyl-])	620-94-0	**	7.83	CTS	4272
	$(C_6H_5CH_2)_2S$ (Benzene, 1,1'-thiobis(methylene)bis-)	538-74-9	**	8.05 ± 0.02	PI	5552
$C_{15}H_{10}S^+$	$C_3(=S)(C_6H_5)_2$ (2-Cyclopropen-1-thione, 2,3-diphenyl-)	2570-01-6	**	11.25 (V)	PE	4856
$C_{15}H_{14}S^+$	$C_{13}H_8S(CH_3)_2$ (9H-Thioxanthene, 9,9-dimethyl-)	19019-10-4	**	7.7 ± 0.1	EI	4664
$C_{16}H_{18}S^+$	$C_6H_5(CH_3)_2SC_6H_3(CH_3)_2$ (Benzene, 1,1'-thiobis[2,6-dimethyl-])	52805-90-0	**	8.36	CTS	4272
$C_{18}H_{16}S^+$	$C_{10}H_6(CH_2CH_2)_2C_4H_2S$ (8,11-Epithio-5,14-ethenobenzocyclododecene, 6,7,12,13-tetrahydro-)	53539-29-0	**	7.50 (V)	PE	5575

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
CH_2S_2^+	$\text{C}_2\text{H}_6\text{S}_2$ (1,3-Dithiolane)	4829-04-3	C_2H_4	10.8 ± 0.2	EI	3598
CH_4S_2^+	HSCH_2SH	6725-64-0	**	9.9 (V)	PE	4405
$\text{C}_2\text{H}_6\text{S}_2^+$	$(\text{CH}_3\text{S})_2$	624-92-0	**	8.3	PE	4188
			**	8.82 (V)	PE	3697
			**	8.96 (V)	PE	5068
			**	8.97 (V)	PE	4276
			**	8.97 (V)	PE	5538
			**	8.97 (V)	PE	5632
			**	8.98 (V)	PE	4218
			**	9. (V)	PE	4410
$\text{C}_3\text{H}_5\text{S}_2^+$	$\text{C}_3\text{H}_6\text{S}_2$ (1,3-Dithiolane)	4829-04-3	H	11.2 ± 0.2	EI	3598
$\text{C}_3\text{H}_6\text{S}_2^+$	$\text{CH}_3\text{C}=\text{SSCH}_3$	2168-84-5	**	8.50 (V)	PE	4427
	$\text{C}_3\text{H}_6\text{S}_2$ (1,3-Dithiolane)	4829-04-3	**	8.75 (V)	PE	4418
			**	8.77 (V)	PE	4756
			**	9.0 ± 0.05	EI	3598
$\text{C}_3\text{H}_8\text{S}_2^+$	$\text{CH}_3\text{SCH}_2\text{SCH}_3$	1618-26-4	**	8.65 (V)	PE	5632
			**	8.67 (V)	PE	4405
$\text{C}_4\text{H}_4\text{S}_2^+$	$\text{C}_4\text{H}_4\text{S}_2$ (1,4-Dithiin)	290-79-9	**	8.1 ± 0.1 (V)	PE	4841
$\text{C}_4\text{H}_8\text{S}_2^+$	$\text{CH}_2=\text{C}(\text{SCH}_3)_2$ <i>cis</i> - $\text{CH}_3\text{SCH}=\text{CHSCH}_3$ <i>trans</i> - $\text{CH}_3\text{SCH}=\text{CHSCH}_3$	51102-74-0	**	8.2 (V)	PE	4291
		764-44-3	**	7.80 (V)	PE	4291
		764-45-4	**	7.85 (V)	PE	4291
			**	7.96 (V)	PE	5632
	$\text{C}_4\text{H}_8\text{S}_2$ (1,2-Dithiane)	505-20-4	**	8.36 (V)	PE	4276
			**	8.36 (V)	PE	5632
	$\text{C}_4\text{H}_8\text{S}_2$ (1,3-Dithiane)	505-23-7	**	8.33 (V)	PE	4756
			**	8.33 (V)	PE	5632
			**	8.54 (V)	PE	3733
	$\text{C}_4\text{H}_8\text{S}_2$ (1,4-Dithiane)	505-29-3	**	8.46 (V)	PE	5632
			**	8.58 (V)	PE	3733
$\text{C}_4\text{H}_{10}\text{S}_2^+$	$(\text{C}_2\text{H}_5\text{S})_2$	110-81-6	**	8.70 (V)	PE	4276
			**	8.70 (V)	PE	5632
			**	8.77 (V)	PE	4410
			**	8.85 (V)	PE	4218
	$\text{CH}_3\text{SCH}_2\text{CH}_2\text{SCH}_3$	6628-18-8	**	8.64 (V)	PE	5632
$\text{C}_5\text{H}_4\text{S}_2^+$	$\text{C}_5\text{H}_4\text{S}(=\text{S})$ (4H-Thiopyran-4-thione)	1120-94-1	**	7.96 ± 0.05 (V)	PE	5002

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_5H_6S_2^+$	$C_4H_5SSCH_3$ (Thiophene, 2-(methylthio)-)	5780-36-9	**	8.63 ± 0.05 (V)	PE	4626
	$C_4H_5S(SH)CH_3$ (2-Thiophenethiol, 5-methyl-)	3970-28-3	**	8.10 ± 0.05	EI	3482
			**	8.48 ± 0.05	EI	4706
$C_5H_{12}S_2^+$	$C_2H_5SCH_2SC_2H_5$	4396-19-4	**	8.66 (V)	PE	4756
			**	8.22 ± 0.02	PI	5531
$C_6H_4S_2^+$	$C_6H_4S_2$ (Thieno[2,3- <i>b</i>]thiophene)	250-84-0	**	8.32	PE	4017
			**	8.32 (V)	PE	5405
			**	8.45 (V)	PE	5478
			**	8.10	PE	4017
	$C_6H_4S_2$ (Thieno[3,2- <i>b</i>]thiophene)	251-41-2	**	8.10 (V)	PE	5405
			**	8.14 (V)	PE	3852
			**			
			**			
$C_6H_8S_2^+$	$C_4H_5S(CH_3)SCH_3$ (Thiophene, 2-methyl-5-(methylthio)-)	40990-29-2	**	8.13 ± 0.05	EI	4706
		29874-05-3	**	8.22 ± 0.05	EI	4706
$C_6H_{10}S_2^+$	<i>cis,cis</i> - $CH_3SCH=CHCH=CHSCH_3$	35822-49-2	**	7.48 (V)	PE	5632
$C_6H_{14}S_2^+$	$(n-C_3H_7S)_2$	629-19-6	**	8.62 (V)	PE	4276
			**	8.62 (V)	PE	5632
	$(iso-C_3H_7S)_2$	4253-89-8	**	8.54 (V)	PE	4276
			**	8.54 (V)	PE	5632
			**	8.51 (V)	PE	4410
$C_7H_6S_2^+$	$C_7H_6S_2$ (Thieno[2,3- <i>b</i>]thiophene,2-methyl-)	13393-75-4	**	8.12 (V)	PE	5478
		1723-34-8	**	8.04 (V)	PE	5478
$C_7H_{10}S_2^+$	$C_4HS(CH_3)_2SCH_3$ (Thiophene, 2,5-dimethyl-3-(methylthio)-)	63359-64-8	**	7.96 ± 0.05	EI	4706
$C_8H_6S_2^+$	$(C_4H_5S)_2$ (3,3'-Bithiophene)	3172-56-3	**	8.2 (V)	PE	5422
$C_8H_8S_2^+$	$C_8H_8S_2$ (1,6-Dithiecin, 3,4,8,9-tetradehydro-2,5,7,10-tetrahydro-)	53690-50-9	**	8.73 ± 0.02 (V)	PE	4180
$C_8H_{10}S_2^+$	$C_6H_4(SCH_3)_2$ (Benzene,1,2-bis(methylthio)-)	2388-68-3	**	8.0 (V)	PE	5403
		2388-69-4	**	8.0 (V)	PE	5403
	$C_6H_4(SCH_3)_2$ (Benzene,1,3-bis(methylthio)-)	699-20-7	**	7.93 (V)	PE	3781

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_8H_{10}S_2^+$	$C_6H_4(SCH_3)_2$	699-20-7	**	7.93 (V)	PE	5403
$C_8H_{12}S_2^+$	$C_4(=S)_2(CH_3)_4$ (1,3-Cyclobutanedithione, 2,2,4,4-tetramethyl-)	10181-56-3	**	8.35 (V)	PE	5499
$C_8H_{18}S_2^+$	$n-C_4H_9SSn-C_4H_9$ (<i>tert</i> - C_4H_9S) ₂	629-45-8 110-06-5	** ** ** ** **	8.51 (V) 8.15 (V) 8.17 (V) 8.17 (V) 8.20 (V)	PE PE PE PE PE	4410 4410 4276 5632 4218
$C_{10}H_6S_2^+$	$C_{10}H_6S_2$ (Naphtho[1,8- <i>cd</i>]-1,2-dithole)	209-22-3	**	7.15 (V)	PE	4782
$C_{10}H_{12}S_2^+$	$C_{10}H_{12}S_2$ (1,3-Benzodithiole-2-ethyl-2-methyl-)	58657-45-7	**	7.85 (V)	PE	5410
$C_{12}H_{12}S_2^+$	$(C_4H_2SCH_2CH_2)_2$ (13,14-Dithiatricyclo[8.2.1.1 ^{4,7}]tetradeca-4,6,10,12-tetraene)	73650-69-8	**	7.95	PE	5575
	$C_{10}H_6(SCH_3)_2$ (Naphthalene, 1,4-bis(methylthio)-)	10075-73-7	**	7.58 (V)	PE	5204
	$C_{10}H_6(SCH_3)_2$ (Naphthalene, 1,5-bis(methylthio)-)	10075-74-8	**	7.58 (V) 7.66 (V)	PE PE	5612 5204
	$C_{10}H_6(SCH_3)_2$ (Naphthalene, 1,8-bis(methylthio)-)	7343-31-9	**	7.55 (V)	PE	5204
	$C_{10}H_6(SCH_3)_2$ (Naphthalene, 2,6-bis(methylthio)-)	10075-77-1	**	7.59 (V)	PE	5204
			**	7.59 (V)	PE	5612
$C_{16}H_{14}S_2^+$	$C_{14}H_8S_2(CH_3)_2$ (Anthracene-9,10-bis(methylthio)-)	10075-83-9	**	7.44 (V)	PE	5612
$C_{20}H_{30}S_2^+$	$(C_{10}H_{15}S)_2$ (Disulfide, bis(tricyclo[3.3.1.1 ^{3,7}]dec-1-yl))	34895-45-9	**	7.86 (V)	PE	5395
$C_{20}H_{32}S_2^+$	$C_{12}H_8S_2(CH_3)_8$ (Cyclobuta[1,2- <i>d</i> :3,4- <i>d'</i>]bisthiopin, 1,2,4,5,6,7,9,10-octahydro-1,1,5,5,6,6,10,10-octamethyl-)	40219-42-9		6.89 (V)	PE	4304
$C_{30}H_{20}S_2^+$	$C_6S_2(C_6H_5)_4$ (Thieno[3,4- <i>c</i>]thiophene-2,5-5 ^{IV} , 1,3,4,6-tetraphenyl-)	36516-81-1	**	6.19 (V)	PE	4838
$C_2H_2S_3^+$	$C_2H_2S_2(=S)$ (1,3-Dithietane-2-thione)	18555-26-5	**	8.83 (V)	PE	4549
$C_2H_4S_3^+$	$C_2H_4S_3$ (1,2,4-Trithiolane)	289-16-7	** **	8.72±0.2 (V) 8.72 (V)	PE PE	5415 4410

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_3H_2S_3^+$	$C_3H_2S_3$ (1,3-Dithiole-2-thione)	930-35-8	**	8.26 (V)	PE	5410
	$(C_3H_2S_2)=S$ (3H-1,2-Dithiole-3-thione)	534-25-8	**	8.3 (V)	PE	4549
			**	8.42 (V)	PE	4403
$C_3H_4S_3^+$	$C_3H_4S_2S$ (1,3-Dithiolane-2-thione)	822-38-8	**	8.40 (V)	PE	4407
			**	8.40 (V)	PE	4323
$C_3H_6S_3^+$	$(CH_3S)_2CS$	2314-48-9	**	8.5 (V)	PE	4323
	$C_3H_6S_3$ (1,3,5-Trithiane)	291-21-4	**	8.76 (V)	PE	3733
			**	8.83±0.05 (V)	PE	4212
$C_4H_4S_3^+$	$(C_3HS_2)=S(CH_3)$ (3H-1,2-Dithiole-3-thione, 4-methyl-)	3354-41-4	**	8.23 (V)	PE	4403
	$(C_3HS_2)=S(CH_3)$ (3H-1,2-Dithiole-3-thione, 5-methyl-)	3354-40-3	**	8.25 (V)	PE	4403
$C_4H_6S_3^+$	$C_4H_6S_2=S$ (1,3-Dithiane-2-thione)	1748-15-8	**	8.40 (V)	PE	4323
$C_5H_4S_3^+$	$C_5H_4S_4$ ([1,2]Dithiolo[1,5- <i>b</i>][1,2]dithiole-7- S^{IV})	252-09-5	**	8.11 (V)	PE	3569
$C_6H_6S_3^+$	$C_5H_3S_3CH_3$ ([1,2]Dithiolo[1,5- <i>b</i>][1,2]dithiole-7- S^{IV} , 2-methyl-)	20718-55-2	**	7.83 (V)	PE	3569
$C_6H_{12}S_3^+$	$C_3H_3S_3(CH_3)_3$ (1,3,5-Trithiane, 2,4,6-trimethyl-)	2765-04-0	**	8.39±0.05 (V)	PE	4212
	$C_6H_{12}S_4$ (1,2,4-Trithiolane,3,3,5,5-tetramethyl-)	38348-31-1	**	8.12±0.2 (V)	PE	5415
			**	8.12 (V)	PE	4410
$C_7H_4S_3^+$	$C_7H_4S_3$ (1,3-Benzodithiole-2-thione)	934-36-1	**	8.14 (V)	PE	5410
	$(C_7H_4S_2)=S$ (3H-1,2-Benzodithiole-3-thione)	3354-42-5	**	8.10 (V)	PE	4403
$C_7H_8S_3^+$	$C_5H_2S_3(CH_3)_2$ ([1,2]Dithiolo[1,5- <i>b</i>][1,2]dithiole-7- S^{IV} , 2,5-dimethyl-)	2080-35-5	**	7.73 (V)	PE	3569
	$C_5H_2S_3(CH_3)_2$ ([1,2]Dithiolo[1,5- <i>b</i>][1,2]dithiole-7- S^{IV} , 3,4-dimethyl-)	29977-00-2	**	7.63 (V)	PE	3569
$C_7H_{10}S_3^+$	$(C_7HS_2)=S(tert-C_4H_9)$ (3H-1,2-Dithiole-3-thione, 5-(1,1-dimethylethyl)-)	29507-64-0	**	8.15 (V)	PE	4403
$C_8H_4S_3^+$	$C_8H_4S_3$ (Dithieno[2,3- <i>b</i> :3',2'- <i>d</i>]thiophene)	236-63-5	**	7.86 (V)	PE	5405

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_8H_4S_3^+$	$C_8H_4S_3$ (Dithieno[3,2- <i>b</i> :2',3'- <i>d</i>]thiophene)	3593-75-7	**	7.8 (V)	PE	5405
	$C_8H_4S_3$ (Dithieno[3,4- <i>b</i> :3',4'- <i>d</i>]thiophene)	13090-49-8	**	7.88 (V)	PE	5405
$C_8H_6S_3^+$	$(C_4H_3S)_2S$ (Thiophene,2,2'-thiobis-)	3988-99-6	**	8.40 (V)	PE	5356
	$(C_4H_3S)_2S$ (Thiophene,3,3'-thiobis-)	3807-38-3	**	8.06 (V)	PE	5356
$C_9H_6S_3^+$	$(C_3HS_2)=S(C_6H_5)$ (3H-1,2-Dithiole-3-thione, 5-phenyl-)	3445-76-9	**	8.11 (V)	PE	4403
$C_9H_{16}S_3^+$	$C_3S_3(CH_3)_6$ (1,3,5-Trithiane, 2,2,4,4,6,6-hexamethyl-)	828-26-2	**	7.95±0.05 (V)	PE	4212
$C_{10}H_8S_3^+$	$(C_3HS_2)=S(C_6H_4CH_3)$ (3H-1,2-Dithiole-3-thione, 5-(4-methylphenyl)-)	6921-83-1	**	8.10 (V)	PE	4403
	$(C_4H_2S)_2C_2H_4S$ (4H,6H-Dithieno[3,4- <i>c</i> :3',4'- <i>e</i>]thiepin)	42850-82-8	**	8.4 (V)	PE	5422
	$(C_4H_2S)_2C_2H_4S$ (Dithieno[2,3- <i>c</i> :3',2'- <i>e</i>]thiepin,4,6-dihydro-)	63286-55-5	**	8.15 (V)	PE	5422
$C_{10}H_{12}S_3^+$	$C_8H_6S_3(CH_3)_2$ (3H-[1,2]Dithiolo[4,5,1- <i>hi</i>][1,2]benzodithiole-8- <i>S</i> ^{IV} , 4,5-dihydro-2,6-dimethyl-)	35437-21-9	**	7.34 (V)	PE	3569
$C_{12}H_{16}S_3^+$	$C_8H_6S_3(C_2H_5)_2$ (3H-[1,2]Dithiolo[4,5,1- <i>hi</i>][1,2]benzodithiole-8- <i>S</i> ^{IV} , 2,6-diethyl-4,5-dihydro-)	35505-46-5	**	7.33 (V)	PE	3569
$C_{11}H_{20}S_3^+$	$C_8H_6S_3(C_3H_7)_2$ (3H-[1,2]Dithiolo[4,5,1- <i>hi</i>][1,2]benzodithiole-8- <i>S</i> ^{IV} , 4,5-dihydro-2,6-bis(1-methylethyl)-)	35505-47-6	**	7.19 (V)	PE	3569
$C_{17}H_{12}S_3^+$	$C_3H_2S_3(C_6H_5)_2$ ([1,2]Dithiolo[1,5- <i>b</i>][1,2]dithiole-7- <i>S</i> ^{IV} , 3,4-diphenyl-)	25730-47-6	**	7.57 (V)	PE	3569
$C_5H_8S_1^+$	$C_5H_8S_1$ (1,4,6,9-Tetrathiaspiro[4.4]nonane)	13145-46-5	**	8.26 (V)	PE	4756
			**	8.35 (V)	PE	4418
$C_5H_{12}S_4^+$	$C(SCH_3)_4$	6156-25-8	**	8.29 (V)	PE	4756
$C_6H_4S_1^+$	$(C_3H_2S_2)_2$ (1,3-Dithiole-2-(1,3-dithiole-2-ylidene)-)	31366-25-3	**	7.00	CTS	5622
			**	6.83 (V)	PE	3981
			**	6.83 (V)	PE	4481
			**	6.92±0.03 (V)	PE	4155
$C_6H_8S_1^+$	$(C_3H_3S_2)_2$ (1,3-Dithiolane, 2-(1,3-dithiolan-2-ylidene)-)	24719-68-4	**	7.05±0.03 (V)	PE	4155

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_6H_8S_4^+$	$(C_3H_4S_2)_2$	24719-68-4	**	7.17 (V)	PE	4481
$C_6H_{10}S_4^+$	$C_6H_{10}S_4$ (2,2-Bi-1,3-dithiolane)	6784-47-0	**	8.6-9.0 (V)	PE	4481
$C_6H_{12}S_4^+$	$(CH_3S)_2C=C(SCH_3)_2$	13046-50-9	**	7.75 (V)	PE	4291
	$C_2S_4(CH_3)_4$ (1,2,4,5-Tetrathiane, 3,3,6,6-tetramethyl-)	4475-72-3	**	8.23±0.02 (V)	PE	4402
$C_7H_{12}S_4^+$	$C_7H_{12}S_4$ (1,5,7,11-Tetrathiaspiro[5.5]undecane)	180-97-2	**	8.09 (V)	PE	4756
$C_{10}H_{12}S_4^+$	$C_6S_4(CH_3)_4$ (1,3-Dithiole, 2-(4,5-dimethyl-1,3-dithiol-2-ylidene)-4,5-dimethyl-)	50708-37-7	**	6.40 (V)	PE	4481
$C_{10}H_{16}S_4^+$	$C_{10}H_{16}S_4$ (6,7,13,14-Tetrathiadispiro[4.2.4.2]tetradecane)	184-05-4	**	8.17±0.02 (V)	PE	4402
$C_{12}H_{20}S_4^+$	$C_{12}H_{20}S_4$ (7,8,15,16-Tetrathiadispiro[5.2.5.2]hexadecane)	183-85-7	**	7.98±0.02 (V)	PE	4402
$C_{14}H_8S_4^+$	$(C_6H_4S_2C)_2$ (1,3-Benzodithiole, 2-(1,3-benzodithiol-2-ylidene)-)	24648-13-2	**	6.81 (V)	PE	4461
$C_{10}H_{18}S_6^+$	$C_4H_8S_2$ (1,4-Dithiane)	505-29-3	**	8.46 (V)	PE	5632
$B_9CH_{11}S^+$	$SB_9H_9(CH_3)$ (1-Thiadecaborane(9),10-methyl-)	64173-76-8	**	10.0 (V)	PE	5324
$BC_3H_9S^+$	$(CH_3)_2BSCH_3$	19163-05-4	**	9.40 (V)	PE	4065
$BC_{12}H_{19}S^+$	$C_6H_5SB(n-C_3H_7)_2$ (Boric acid, dipropylthio-phenyl ester)	4443-46-3	**	8.77±0.05 (V)	PE	4848
$BC_{13}H_{21}S^+$	$C_6H_4(CH_3)SB(n-C_3H_7)_2$ (Boric acid, dipropylthio-3-methylphenyl ester)	64503-47-5	**	8.59±0.05 (V)	PE	4848
	$C_6H_4(CH_3)SB(n-C_3H_7)_2$ (Boric acid, dipropylthio-4-methylphenyl ester)	64503-46-4	**	8.48±0.05 (V)	PE	4848
$BC_3H_9S_2^+$	$(CH_3S)_2BCH_3$	19163-08-7	**	8.74 (V)	PE	4065
$B_2C_2H_6S_3^+$	$B_2S_4(CH_3)_2$ (1,2,4,3,5-Trithiadiborolane, 3,5-dimethyl-)	25592-09-0	**	9.04 (V)	PE	4526
$BC_3H_9S_3^+$	$B(SCH_3)_3$	997-49-9	**	8.74 (V)	PE	4065

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
NS⁺ (² II)	NS	51801-08-2	**	8.87±0.01 (V)	PE	4657
	(SN) ₂	XXXXX-XX-X		13.0±0.6	EI	4870
	(SN) ₄	XXXXX-XX-X		14.1±0.6	EI	4870
NS₂⁺	(SN) ₂	XXXXX-XX-X		12.2±0.6	EI	4870
N₂S₂⁺	(SN) ₂	XXXXX-XX-X	**	11.5±0.6	EI	4870
	S ₂ N ₂	25474-92-4	**	10.41	PE	4718
	S ₂ N ₂	45346-74-5	**	10.51 (V)	PE	5355
	(Sulfur nitride)					
	(SN) ₄	XXXXX-XX-X		13.7±0.6	EI	4870
N₃S₃⁺						
	(SN) ₄	XXXXX-XX-X		12.3±0.6	EI	4870
N₄S₄⁺						
	(SN) ₄	XXXXX-XX-X	**	10.4±0.6	EI	4870
	(S ₄ N ₄) (Nitrogen sulfide)	28950-34-7	**	9.36 (V)	PE	5355
C₂N₂S⁺						
	S(C≡N) ₂	627-52-1	**	11.32 (V)	PE	4476
C₂N₂S₂⁺						
	(SCN) ₂	505-14-6	**	11.05±0.02	PE	5363
CHNS⁺	HNCS	3129-90-6	**	9.94±0.02 (V)	PE	3670
CH₂NS⁺						
	NH(CH ₃)CSNH ₂	598-52-7		12.45	EI	4878
CH₃NS⁺						
	HCSNH ₂	115-08-2	**	8.69	PE	4469
C₂H₃NS⁺						
	CH ₃ NCS	556-61-6	**	9.37±0.02 (V)	PE	3670
	CH ₃ SCN	556-64-9	**	9.96±0.05 (V)	PE	5026
C₂H₄NS⁺						
	(NHCH ₃) ₂ CS	534-13-4		12.20	EI	4878
	N(CH ₃) ₂ CSNHCH ₃	2489-77-2		11.25	EI	4878
C₂H₅NS⁺						
	CH ₃ CSNH ₂	62-55-5	**	8.33 (V)	PE	4323
			**	8.36	PE	4469
C₃H₃NS⁺						
	C ₃ H ₃ NS (Isothiazole)	288-16-4	**	9.55	PE	3587
			**	9.62 (V)	PE	5213
			**	9.80	EI	3587
	C ₃ H ₃ NS (Thiazole)	288-47-1	**	9.50 (V)	PE	5213
C₃H₅NS⁺						
	C ₂ H ₅ NCS	542-85-8	**	9.12±0.05 (V)	PE	5026
	C ₂ H ₅ SCN	542-90-5	**	9.77±0.05 (V)	PE	5026

Table of Ion Energetics Measurements—Continued

Ion - (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_3H_6NS^+$	$((CH_3)_2N)_2CS$	2782-91-4		11.20	EI	4878
$C_3H_7NS^+$	$HCSN(CH_3)_2$	758-16-7	** **	8.16 8.2 (V)	PE PE	4469 4323
$C_4H_5NS^+$	$C_3H_2NS(CH_3)$ (Isothiazole, 3-methyl-)	693-92-5	**	9.60	EI	3587
	$C_3H_2NS(CH_3)$ (Isothiazole, 4-methyl-)	693-90-3	**	9.25	PE	3587
	$C_3H_2NS(CH_3)$ (Isothiazole, 5-methyl-)	693-97-0	**	9.65	EI	3587
$C_4H_9NS^+$	$CH_3CSN(CH_3)_2$	631-67-4	**	7.86	PE	4469
$C_5H_3NS^+$	C_4H_3SCN (2-Thiophenecarbonitrile)	1003-31-2	** **	9.83±0.05 10.00	EI CTS	3482 4382
$C_5H_5NS^+$	$C_5H_4N(SH)$ (2-Pyridinethiol)	73018-10-7	** **	8.79±0.03 (V) 8.92±0.02	PE EI	4711 3636
	$C_5H_4N(SH)$ (3-Pyridinethiol)	16133-26-9	** **	8.89±0.03 (V) 9.41±0.02	PE EI	4711 3636
	$C_5H_4N(SH)$ (4-Pyridinethiol)	4556-23-4	** **	9.25±0.03 (V) 9.50±0.02	PE EI	4711 3636
	$C_5H_4NH(=S)$ (2(1H)-Pyridinethione)	2637-34-5	** **	7.80±0.03 (V)	PE	4711
$C_5H_9NS^+$	$n-C_4H_9NCS$	592-82-5	**	9.02±0.05 (V)	PE	5026
	$n-C_4H_9SCN$	628-83-1	**	9.64±0.05 (V)	PE	5026
$C_5H_{11}NS^+$	$CH_2=C(SCH_3)N(CH_3)_2$	24854-14-6	**	7.8 (V)	PE	4291
$C_6H_7NS^+$	$C_5H_4N(SCH_3)$ (Pyridine, 2-(methylthio)-)	18438-38-5	** **	8.24±0.03 (V) 8.47±0.02	PE EI	4711 3636
	$C_5H_4N(SCH_3)$ (Pyridine, 3-(methylthio)-)	18794-33-7	** **	8.41±0.03 (V) 8.93±0.02	PE EI	4711 3636
	$C_5H_4N(SCH_3)$ (Pyridine, 4-(methylthio)-)	22581-72-2	** **	8.73±0.03 (V) 9.00±0.02	PE EI	4711 3636
	$C_5H_4N(=S)CH_3$ (2(1H)-Pyridinethione, 1-methyl-)	2044-27-1	** **	7.69±0.03 (V) 7.84±0.02	PE EI	4711 3636
	$C_5H_4N(=S)CH_3$ (4(1H)-Pyridinethione, 1-methyl-)	6887-59-8	** **	7.6±0.03 (V) 7.54±0.02	PE EI	4711 3636
$C_7H_5NS^+$	C_6H_5NCS (Benzene, isothiocyanato-)	103-72-0	**	8.53 (V)	PE	4495

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₇H₅NS⁺	C ₇ H ₅ NS (Benzothiazole)	95-16-9	**	8.85 (V)	PE	4437
C₇H₉NS⁺	C ₆ H ₄ (SCH ₃)NH ₂ (Benzenamine, 4-(methylthio)-)	104-96-1	**	7.6 (V)	PE	5403
			**	7.60 ± 0.01 (V)	PE	4389
C₈H₇NS⁺	C ₇ H ₄ NS(CH ₃) (Benzothiazole, 2-methyl-)	120-75-2	**	8.65 (V)	PE	4437
C₈H₈NS⁺	C ₆ H ₅ NHCSCH ₃ (Ethanethioamide, N-phenyl-)	637-53-6	H	9.60	EI	4834
	C ₆ H ₄ FNHCSCH ₃ (Ethanethioamide, N-(2-fluorophenyl)-)	39184-82-2	F	9.50	EI	4834
	C ₆ H ₄ ClNHCSCH ₃ (Ethanethioamide, N-(2-chlorophenyl)-)	39184-83-3	Cl	8.65	EI	4834
			Cl	8.65	EI	4834
	C ₆ H ₄ BrNHCSCH ₃ (Ethanethioamide, N-(2-bromophenyl)-)	62635-46-5	Br	8.50	EI	4834
	C ₆ H ₄ INHCSCH ₃ (Ethanethioamide, N-(2-iodophenyl)-)	39184-84-4	I	8.55	EI	4834
C₈H₉NS⁺	C ₆ H ₅ NHCSCH ₃ (Ethanethioamide, N-phenyl-)	637-53-6	**	8.20	EI	4834
C₉H₁₃NS⁺	C ₆ H ₄ (SCH ₃)N(CH ₃) ₂ (Benzenamine, N,N-dimethyl-4-(methylthio)-)	2388-51-4	**	7.29 ± 0.01 (V)	PE	4389
C₁₀H₉NS⁺	C ₆ H ₅ CH ₂ (C ₃ H ₂ NS) (Isothiazole, 4-(phenylmethyl)-)	36412-26-7	**	9.05	PE	3587
			**	9.35	EI	3587
C₁₂H₉NS⁺	C ₁₂ H ₉ NS (10H-Phenothiazine)	92-84-2	**	7.26 ± 0.08 (V)	PE	4667
			**	6.74 ± 0.07	CTS	4079
			**	6.87	CTS	4035
C₁₂H₁₆NS⁺	C ₆ H ₄ ClNHCSCH ₂ C(CH ₃) ₃ (Butanethioamide, N-(2-chlorophenyl)-3,3-dimethyl-)	62635-54-5		8.65	EI	4834
C₁₃H₁₁NS⁺	C ₁₂ H ₉ NS(CH ₃) (10H-Phenothiazine, 10-methyl-)	1207-72-3	**	7.15 ± 0.07 (V)	PE	4667
			**	6.73 ± 0.07	CTS	4079
C₁₄H₁₁NS⁺	C ₁₃ H ₇ (=S)NHCH ₃ (Phenylene, 1-thione-9-methylamino-)	XXXXX-XX-X	**	7.21 ± 0.04 (V)	PE	5595
C₁₆H₁₅NS⁺	C ₁₃ H ₇ (=S)NH(<i>iso</i> -C ₃ H ₇) (Phenylene, 1-thione-9-(methylethyl)amino-)	XXXXX-XX-X	**	7.17 ± 0.04 (V)	PE	5595

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$\text{CH}_7\text{N}_2\text{S}^+$	$(\text{NH}_2)_2\text{CS}$	62-56-6	**	7.9	PE	4221
			**	8.41 ± 0.03 (V)	PE	4253
			**	8.41 (V)	PE	4323
			**	8.50 (V)	PE	4469
			**	8.50	EI	4834
$\text{C}_2\text{H}_8\text{N}_2\text{S}^+$	$(\text{CH}_3)_2\text{S}(=\text{NH})_2$	13904-95-5	**	8.87 (V)	PE	4827
			**	8.87 (V)	PE	5207
$\text{C}_3\text{H}_6\text{N}_2\text{S}^+$	$\text{C}_3\text{H}_6\text{N}_2=\text{S}$ (2-Imidazolidinethione)	96-45-7	**	8.15 ± 0.03 (V)	PE	4253
		24692-43-1	**	8.92 (V)	PE	4024
	$\text{C}_2\text{H}_3\text{N}_2\text{SCH}_3$ (1,2,5-Thia(S^{IV})diazole, 3,4-dihydro-3-methyl-)					
$\text{C}_3\text{H}_8\text{N}_2\text{S}^+$	$(\text{CH}_3\text{NH})_2\text{CS}$	534-13-4	**	8.08 ± 0.03 (V)	PE	4253
$\text{C}_4\text{H}_2\text{N}_2\text{S}^+$	$\text{C}_3\text{H}_2\text{NS}(\text{CN})$ (4-Isothiazolecarbonitrile)	3912-37-6	**	10.55	EI	3587
$\text{C}_4\text{H}_6\text{N}_2\text{S}^+$	$\text{C}_4\text{H}_3\text{N}_2(=\text{S})\text{CH}_3$ (2H-Imidazole-2-thione, 1,3-dihydro-1-methyl-)	60-56-0	**	7.41 ± 0.03 (V)	PE	4253
$\text{C}_4\text{H}_8\text{N}_2\text{S}^+$	$\text{C}_2\text{H}_2\text{N}_2\text{S}(\text{CH}_3)_2$ (1,2,5-Thia(S^{IV})diazole, 3,4-dihydro-3,3-dimethyl-)	24692-45-3	**	9.62 (V)	PE	4024
$\text{C}_5\text{H}_8\text{N}_2\text{S}^+$	$\text{C}_5\text{H}_2\text{N}_2(=\text{S})(\text{CH}_3)_2$ (2H-Imidazole-2-thione, 1,3-dihydro-1,3-dimethyl-)	6596-81-2	**	7.27 ± 0.03 (V)	PE	4253
	$\text{C}_5\text{H}_2\text{N}_2(=\text{S})(\text{CH}_3)_2$ (3H-Pyrazole-3-thione, 1,2-dihydro-1,2-dimethyl-)	55833-07-3	**	7.55 (V)	PE	5309
$\text{C}_5\text{H}_{10}\text{N}_2\text{S}^+$	$\text{C}_5\text{H}_4\text{N}_2(=\text{S})(\text{CH}_3)_2$ (2-Imidazolidinethione, 1,3-dimethyl-)	13461-16-0	**	7.95 ± 0.03 (V)	PE	4253
$\text{C}_5\text{H}_{12}\text{N}_2\text{S}^+$	$((\text{CH}_3)_2\text{N})_2\text{CS}$	2782-91-4	**	7.82 ± 0.03	PE	4253
			**	7.82 (V)	PE	4323
			**	7.84 (V)	PE	4469
			**	8.18 (V)	PE	5215
	$\text{C}_5\text{H}_6\text{N}_2\text{S}(\text{CH}_3)_2$ (2H-1,3,4-Thiadiazine, tetrahydro-3,4-dimethyl-)	66175-24-4				
$\text{C}_6\text{H}_4\text{N}_2\text{S}^+$	$\text{C}_6\text{H}_4\text{N}_2\text{S}$ (1,2,3-Benzothiadiazole)	273-77-8	**	9.15 (V)	PE	3852
			**	9.50 ± 0.05	EI	4316
	$\text{C}_6\text{H}_4\text{N}_2\text{S}$ (2,1,3-Benzothiadiazole)	273-13-2	**	8.98	PE	4017
			**	9.00 (V)	PE	3852
$\text{C}_6\text{H}_{10}\text{N}_2\text{S}^+$	$\text{C}_3\text{HN}_2(=\text{S})(\text{CH}_3)_3$ (3H-Pyrazole-3-thione, 1,2-dihydro-1,2,4-trimethyl-)	66187-19-7	**	7.60 (V)	PE	5309

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_6H_{12}N_2S^+$	$C_4H_6N_2(=S)(CH_3)_2$ (2(1 <i>H</i>)-Pyrimidinethione, tetrahydro-1,3-dimethyl-)	16597-35-6	**	7.58 (V)	PE	4323
$C_7H_7N_2S^+$	$C_6H_5NHCSNH_2$ (Thiourea, phenyl-)	103-85-5	H	9.65	EI	4834
	$C_6H_4(CH_3)NHCSNH_2$ (Thiourea, (2-methylphenyl)-)	614-78-8	CH ₃	9.60	EI	4834
	$C_6H_4(OCH_3)NHCSNH_2$ (Thiourea, (2-methoxyphenyl)-)	1516-37-6	**	8.95	EI	4834
	$C_6H_4(NO_2)NHCSNH_2$ (Thiourea, (2-nitrophenyl)-)	51039-84-0	NO ₂	8.60	EI	4834
	$C_6H_4F NHCSNH_2$ (Thiourea, (2-fluorophenyl)-)	656-32-6	F	9.60	EI	4834
	$C_6H_4Cl NHCSNH_2$ (Thiourea, (2-chlorophenyl)-)	5344-82-1	Cl	8.50	EI	4834
	$C_6H_4Br NHCSNH_2$ (Thiourea, (2-bromophenyl)-)	5391-30-0	Br	8.35	EI	4834
	$C_6H_4I NHCSNH_2$ (Thiourea, (2-iodophenyl)-)	62635-52-3	I	8.55	EI	4834
$C_7H_8N_2S^+$	$C_6H_5NHCSNH_2$ (Thiourea, phenyl-)	103-85-5	**	8.10	EI	4834
$C_8H_8N_2S^+$	$C_7H_7NS(NH_2)CH_3$ (6-Benzothiazolamine, 2-methyl-)	2941-62-0	**	7.70 (V)	PE	4437
$C_8H_9N_2S^+$	$C_6H_5N(CH_3)CSNH_2$ (Thiourea, N-methyl-N-phenyl-)	4104-75-0		9.70	EI	4834
	$C_6H_4Cl NHCSNHCH_3$ (Thiourea, N-(2-chlorophenyl)-N'-methyl-)	30954-73-5	Cl	8.35	EI	4834
$C_8H_{10}N_2S^+$	$C_6H_5N(CH_3)CSNH_2$ (Thiourea, N-methyl-N-phenyl-)	2724-69-8	**	8.00	EI	4834
			**	8.05 ± 0.05	EI	4834
	$C_6H_4(CH_3)NHCSNH_2$ (Thiourea, (2-methylphenyl)-)	614-78-8	**	8.20	EI	4834
$C_8H_{18}N_2S^+$	$((CH_3)_3CN)_2S$	2056-74-8	**	8.65 (V)	PE	4024
$C_9H_6N_2S^+$	$C_7H_5NS(CN)CH_3$ (6-Benzothiazolecarbonitrile, 2-methyl-)	42474-60-2	**	9.15 (V)	PE	4437
$C_9H_{10}N_2S^+$	$C_7H_4N_2(S)(CH_3)_2$ (2 <i>H</i> -Benzimidazole-2-thione, 1,3-dihydro-1,3-dimethyl-)	3418-46-0	**	7.46	PE	4555
$C_9H_{11}N_2S^+$	$C_6H_4Cl NHCSNHC_2H_5$ (Thiourea, N-(2-chlorophenyl)-N'-ethyl-)	19384-08-8	Cl	8.35	EI	4834
$C_9H_{12}N_2S^+$	$C_6H_5NHCSNHC_2H_5$ (Thiourea, N-ethyl-N'-phenyl-)	2741-06-2	**	7.95 ± 0.05	EI	4834

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_9H_{11}N_2S^+$	$C_5H_2N_2S(CH_3)_4$ (Isothiazolo[5,1- <i>c</i>]isothiazole-7- <i>S</i> ^{IV} , 1,6-dihydro-1,2,5,6-tetramethyl-)	52353-57-8	**	6.44 (V)	PE	4406
$C_{10}H_{13}N_2S^+$	$C_6H_7ClNHCSNHCH(CH_3)_2$ (Thiourea, <i>N</i> -(2-chlorophenyl)- <i>N'</i> -(1-methylethyl)-)	62635-49-8	Cl	8.25	EI	4834
$C_{10}H_{11}N_2S^+$	$C_6H_5NHCSNHCH(CH_3)_2$ (Thiourea, <i>N</i> -(1-methylethyl)- <i>N'</i> -phenyl-)	15093-36-4	**	7.90±0.05	EI	4834
$C_{11}H_{15}N_2S^+$	$C_6H_7ClNHCSNHCH(CH_3)_3$ (Thiourea, <i>N</i> -(2-chlorophenyl)- <i>N'</i> -(1,1-dimethylethyl)-)	62635-50-1	Cl	8.10	EI	4834
$C_{11}H_{16}N_2S^+$	$C_6H_5NHCSNHCH(CH_3)_3$ (Thiourea, <i>N</i> -(1,1-dimethylethyl)- <i>N'</i> -phenyl-)	14327-04-9	**	7.85±0.05	EI	4834
$C_{12}H_{12}N_2S^+$	$(C_6H_5NH_2)_2S$ (Benzenamine, 4,4'-thiobis-)	139-65-1	**	6.75	PI	4328
$C_{12}H_{20}N_2S^+$	$C_{12}H_{20}N_2S$ (7-Thia-14,15-diazadispiro[5.1.5.2]pentadec-14-ene)	28037-21-0	**	8.57 (V)	PE	4429
$C_{16}H_{18}N_2S^+$	$C_{12}H_8NSCH_2CH_2N(CH_3)_2$ (10 <i>H</i> -Phenothiazine-10-ethanamine, <i>N,N</i> -dimethyl-)	522-24-7	**	8.25±0.07	CTS	4079
$C_{17}H_{20}N_2S^+$	$C_{12}H_8NS(CH_3)_3N(CH_3)_2$ (10 <i>H</i> -Phenothiazine-10-propanamine, <i>N,N</i> -dimethyl-)	58-40-2	**	7.20±0.06 (V)	PE	4667
			**	8.22±0.07	CTS	4079
$C_{18}H_{22}N_2S^+$	$C_{12}H_8NSCH_2CH_2N(C_2H_5)_2$ (10 <i>H</i> -Phenothiazine-10-ethanamine, <i>N,N</i> -diethyl-)	60-91-3	**	7.85±0.07	CTS	4079
$C_4H_7N_3S^+$	$C_2HN_3(=S)(CH_3)_2$ (4 <i>H</i> -1,2,3-Triazole-4-thione, 2,3-dihydro-2,3-dimethyl-)	64808-28-2	**	7.97 (V)	PE	5309
		34618-67-2	**	7.25 (V)	PE	5309
$C_5H_9N_3S^+$	$C_2N_3(=S)(CH_3)_3$ (3 <i>H</i> -1,2,4-Triazole-3-thione, 2,4-dihydro-2,4,5-trimethyl-)	37526-42-4	**	7.63 (V)	PE	4439
		64808-27-1	**	7.95 (V)	PE	5309
	$C_2N_3(S)(CH_3)_3$ (4 <i>H</i> -1,2,3-Triazole-4-thione, 2,3-dihydro-2,3,5-trimethyl-) $C_2N_3(S)(CH_3)_3$ (1 <i>H</i> -1,2,3-Triazolium, 4-mercapto-1,3,5-trimethyl-hydroxide, inner salt)	66187-20-0	**	7.02 (V)	PE	5309
$C_7H_9N_3S^+$	$C_6H_7(NH_2)NHCSNH_2$ (Thiourea, (2-aminophenyl)-)	3394-09-0	**	8.10	EI	4834
$C_9H_9N_3S^+$	$C_6H_5C_3HN_3(=S)CH_3$ (3 <i>H</i> -1,2,4-Triazole-3-thione, 2,4-dihydro-4-methyl-5-phenyl-)	38942-51-7	**	7.78 (V)	PE	4439

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{10}H_{11}N_3S^+$	$C_6H_5C_2N_3(=S)(CH_3)_2$ (3H-1,2,4-Triazole-3-thione, 2,4-dihydro-2,4-dimethyl-5-phenyl-)	7112-00-7	**	7.59 (V)	PE	4439
$C_{20}H_{25}N_3S^+$	$C_{12}H_8NS(CH_2)_3C_4H_8N_2CH_3$ (10H-Phenothiazine, 10-[3-(4-methyl-1-piperazinyl)propyl]-)	84-97-9	**	6.87 ± 0.07	CTS	4079
$C_3H_3NS_2^+$	$C_3H_3NS=S$ (2(3H)-Thiazolethione)	5685-05-2	**	7.74 ± 0.03 (V)	PE	4253
$C_3H_5NS_2^+$	$C_3H_5NS=S$ (2-Thiazolidinethione)	96-53-7	**	8.25 ± 0.03 (V)	PE	4253
$C_4H_5NS_2^+$	$C_3H_3NS(=S)CH_3$ (2(3H)-Thiazolethione, 3-methyl-)	5685-07-4	**	7.68 ± 0.03 (V)	PE	4253
$C_4H_7NS_2^+$	$C_3H_4NS(=S)CH_3$ (2-Thiazolidinethione, 3-methyl-)	1908-87-8	**	8.04 ± 0.03	PE	4253
$C_4H_9NS_2^+$	$(CH_3)_2NCSSCH_3$	3735-92-0	** **	8.01 ± 0.03 8.01 (V)	PE PE	4253 4323
$C_5H_7NS_2^+$	$C_3HNS(=S)(CH_3)_2$ (2(3H)-Thiazolethione, 3,4-dimethyl-)	5316-79-0	**	7.55 ± 0.03 (V)	PE	4253
	$C_3HNS(=S)(CH_3)_2$ (2(3H)-Thiazolethione, 4,5-dimethyl-)	5351-51-9	**	7.56 ± 0.03 (V)	PE	4253
$C_5H_9NS_2^+$	$C_3H_4NS(=S)(CH_3)_2$ (2-Thiazolidinethione, 4,4-dimethyl-)	1908-88-9	**	8.18 ± 0.03 (V)	PE	4253
$C_6H_9NS_2^+$	$C_3NS(=S)(CH_3)_3$ (2(3H)-Thiazolethione, 3,4,5-trimethyl-)	21364-38-5	**	7.45 ± 0.03 (V)	PE	4253
$C_7H_5NS_2^+$	$C_7H_5NS(S)$ (2(3H)-Benzothiazolethione)	149-30-4	**	7.99	PE	4555
$C_8H_7NS_2^+$	$C_7H_4NS(S)(CH_3)$ (2(3H)-Benzothiazolethione, 3-methyl-)	2254-94-6	**	7.81	PE	4555
$C_8H_{11}NS_2^+$	$C_5H_2NS_2(CH_3)_3$ (Methanamine, N-[1-methyl-2-(5-methyl-3H-1,2-dithiol-3-ylidene)ethylidene]-)	57254-27-0	**	7.17 (V)	PE	4406
$C_{12}H_{13}NS_2^+$	$(C_6H_2S)_2C_2H_4NC_2H_5$ (4H-Dithieno[2,3-c:3',2'-e]azepine, 5-ethyl-5,6-dihydro-)	64504-69-4	**	7.9 (V)	PE	5422
$C_{16}H_{13}NS_2^+$	$(C_4H_2S)_2C_2H_4NC_6H_5$ (4H-Dithieno[2,3-c:3',2'-e]azepine, 5,6-dihydro-5-phenyl-)	40306-87-4	**	7.9 (V)	PE	5422
	$(C_4H_2S)_2C_2H_4NC_6H_5$ (4H-Dithieno[3,4-c:3',4'-e]azepine, 5,6-dihydro-5-phenyl-)	64504-70-7	**	7.5 (V)	PE	5422

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{23}H_{15}NS_2^+$	$C_5S_2N(C_6H_5)_3$ (Thieno[3,4-c]isothiazole-5-S ^{IV} ,3,4,6-triphenyl-)	61164-97-4	**	6.9 (V)	PE	5341
$C_2H_6N_2S_2^+$	$NH_2NHC(=S)SCH_3$	5397-03-5	**	8.81	PE	5285
$C_3H_4N_2S_2^+$	$C_2HN_2S(=S)CH_3$ (1,3,4-Thiadiazole-2(3H)-thione, 5-methyl-)	29490-19-5	**	8.33 (V)	PE	4439
$C_3H_8N_2S_2^+$	$NH_2N(CH_3)C(=S)SCH_3$	20184-94-5	**	8.39	PE	5285
$C_4H_6N_2S_2^+$	$C_2N_2S(=S)(CH_3)_2$ (1,3,4-Thiadiazole-2(3H)-thione,3,5-dimethyl-)	7111-96-8	**	7.97 (V)	PE	4439
$C_4H_{10}N_2S_2^+$	$N(CH_3)_2NHC(=S)SCH_3$	25554-63-6	**	8.37	PE	5285
$C_8H_6N_2S_2^+$	$C_6H_5C_2HN_2S(=S)$ (1,3,4-Thiadiazole-2(3H)-thione,5-phenyl-)	5585-19-3	**	8.13 (V)	PE	4439
$C_8H_{10}N_2S_2^+$	$NH(C_6H_5)NHC(=S)SCH_3$ (Hydrazinecarbodithioic acid,2-phenyl-methyl ester)	50878-38-1	**	8.47	PE	5285
$C_9H_8N_2S_2^+$	$C_6H_5C_2N_2S(=S)CH_3$ (1,3,4-Thiadiazole-2(3H)-thione,3-methyl-5-phenyl-)	5770-97-8	**	7.87 (V)	PE	4439
$C_{12}H_{20}N_2S_2^+$	$H_2(CH_3C(=S)CH_2C(CH_3)NCH)_2$	40006-83-5	**	7.60 (V)	PE	5446
$C_{14}H_{14}N_2S_2^+$	$N(C_6H_5)_2NHC(=S)SCH_3$ (Hydrazinecarbodithioic acid,2,2-diphenyl-methyl ester)	50878-39-2	**	7.47	PE	5285
$C_{16}H_{14}N_2S_2^+$	$(C_6H_4N(CH_3)CS)_2$ (Benzothiazole,2,3-dihydro-3-methyl-2-(3-methyl-2(3H)-benzothiazolylidene)-)	2786-70-1	**	5.75 ± 0.2	OTH	5278
$C_{21}H_{26}N_2S_2^+$	$C_{21}H_{26}N_2S_2$	50-52-2	**	7.00 ± 0.08 (V)	PE	4667
$C_5H_3NS_3^+$	$(C_3S_2)=S(CN)(CH_3)$ (3H-1,2-Dithiole-4-carbonitrile, 5-methyl-3-thioxo-)	24045-79-2	**	8.70 (V)	PE	4403
$B_2C_3H_{10}N_2S^+$	$N_2B_2SH(CH_3)_3$ (1,3,4,2,5-Thiadiazadiborolidine, 2,3,5-trimethyl-)	57877-85-7	**	8.32 (V)	PE	4526
$B_2C_4H_{12}N_2S^+$	$N_2B_2S(CH_3)_4$ (1,3,4,2,5-Thiadiazadiborolidine, 2,3,4,5-tetramethyl-)	40392-37-8	**	8.00 (V)	PE	4526
$B_2C_2H_7NS_2^+$	$NB_2S_2H(CH_3)_2$ (1,2,4,3,5-Dithiazadiborolidine, 3,5-dimethyl-)	57877-87-9	**	8.69 (V)	PE	4526

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$B_2C_3H_9NS_2^+$	$NB_2S_2(CH_3)_3$ (1,2,4,3,5-Dithiazadiborolidine, 3,4,5-trimethyl-)	57877-88-0	**	8.58 (V)	PE	4526
$B_2C_5H_{15}N_3S_2^+$	$N_3B_2(CH_3)_4(SCH_3)_2$ (1,2,4,3,5-Triazadiborolidine, 1,2,4-trimethyl-3,5-bis(methylthio)-)	40392-36-7	**	7.74 (V)	PE	4526
$B_2C_6H_{18}N_4S_2^+$	$B_2N_3(CH_3)_4(SCH_3)_2$ (1,2,4,5,3,6-Tetrazadiborine, hexahydro-1,2,4,5-tetramethyl-3,6-bis(methylthio)-)	54154-14-2	**	7.39 (V)	PE	4299
OS^+						
$(^2\Pi_{3/2g})$	$SO(^3\Sigma^-)$	13827-32-2	**	10.29 ± 0.01	PE	4230
			**	10.31	PE	4186
$(^2\Pi)$			**	10.32	PE	3701
$(^2\Pi_{1/2g})$				10.33 ± 0.01	PE	4230
$(^4\Pi)$			**	11.3	PE	3701
$(^4\Pi_u)$			**	13.50 ± 0.05	PE	4230
$(^2\Pi_u)$			**	~ 14.4	PE	4230
$(^4\Sigma_g^-)$			**	14.94 ± 0.01	PE	4230
$(^4\Sigma^-)$			**	14.96	PE	3701
$(^2\Sigma_g^-)$			**	16.44 ± 0.01	PE	4230
$(^2\Pi_u)$			**	~ 19.6	PE	4230
			**	10.20 ± 0.03	EI	4920
			**	10.28 ± 0.02	EI	3816
	SO_2	7446-09-5	O	15.930 ± 0.005	PE	5388
	S_2O	20901-21-7	**	13.745 ± 0.006	PI	4762
	COS	463-58-1	C	19.8	EI	3779
O_2S^+						
$(^2A_1)$	SO_2	7446-09-5	**	12.3	PE	3865
$(^2A_1)$			**	12.31	PE	4092
$(^2A_1)$			**	12.50 (V)	PE	3879
$(^2A_1)$			**	12.54 (V)	PE	4024
$(^2A_2)$			**	13.01 (V)	PE	4092
$(^2A_2)$			**	13.24 (V)	PE	3879
$(^2A_2)$			**	13.25 (V)	PE	4024
$(^2B_2)$			**	13.30 (V)	PE	4092
$(^2B_2)$			**	13.47 (V)	PE	3879
$(^2B_2)$			**	13.56 (V)	PE	4024
$(^2B_1)$			**	15.99	PE	3879
$(^2B_2)$			**	15.992 ± 0.003	PE	3865
$(^2A_1)$			**	16.324 ± 0.004	PE	3865
$(^2A_1)$			**	16.33	PE	3879
$(^2B_1)$			**	16.498 ± 0.004	PE	3865
$(^2B_1)$			**	16.57 (V)	PE	4092
			**	20.06 ± 0.05	PE	3865
O_3S^+						
	SO_3	7446-11-9	**	12.73 ± 0.05	PE	4388
			**	12.81 ± 0.03	PE	4485
$(^2A_2')$			**	12.82 ± 0.01	PE	4516
			**	12.82 ± 0.03	PE	4149
			**	13.75 ± 0.03	PE	4485
			**	~ 14.5 (V)	PE	4485
			**	14.83 ± 0.03	PE	4485
			**	17.86 ± 0.03	PE	4485
OS_2^+						
	S_2O	20901-21-7	**	10.58 ± 0.01	PI	4762
$(^2A')$			**	10.52	PE	4092
$(^2A')$			**	10.52 (V)	PE	4244

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
OS₂⁺						
(²A')	S ₂ O	20901-21-7	**	10.53±0.02	PE	3841
(²A')			**	10.62	PE	3692
(²A*)			**	11.22	PE	4092
(²A')			**	11.22 (V)	PE	4244
(²A')			**	11.25±0.02	PE	3841
(²A*)			**	11.31±0.02	PE	3841
(²A')			**	11.32	PE	3692
(²A')			**	11.34	PE	4092
(²A*)			**	11.34 (V)	PE	4244
(²A*)			**	11.37	PE	3692
(²A')			**	14.3±0.02	PE	3841
(²A*)			**	14.3	PE	3692
(²A*)			**	14.62 (V)	PE	4092
(²A')			**	14.62 (V)	PE	4244
(²A*)			**	14.82 (V)	PE	4244
(²A')			**	14.84 (V)	PE	4092
(²A*)			**	14.9±0.02	PE	3841
(²A')			**	15.5±0.02	PE	3841
(²A')			**	15.5	PE	3692
(²A')			**	15.80 (V)	PE	4092
(²A')			**	15.80 (V)	PE	4244
(²A')			**	18.5 (V)	PE	4244
(²A')			**	18.50 (V)	PE	4092
COS⁺						
(²Π)	COS	463-58-1	**	11.190	PI	4994
(²Π)			**	15.075	PI	4994
(²Σ ⁺)			**	16.043	PI	4994
(²Σ ⁺)			**	17.955	PI	4994
			**	11.177±0.002	PE	5256
(²Π)			**	11.18±0.01	PE	3965
			**	11.19 (V)	PE	5055
(²Π _{3/2})			**	11.22	PE	4073
(²Π)			**	15.09±0.01	PE	3965
(²Σ ⁺)			**	16.05±0.01	PE	3965
(²Σ ⁺)			**	17.96±0.01	PE	3965
(²Π)			**	11.19±0.05	EI	5027
			**	11.3	EI	3779
CH₂OS⁺						
	C ₃ H ₆ OS (1,3-Oxathiolane)	2094-97-5	C ₂ H ₄	10.4±0.3	EI	3598
CH₃OS⁺						
	(CH ₃) ₂ SO	67-68-5	CH ₃	10.91±0.16	EI	5311
	(C ₂ H ₅) ₂ SO	70-29-1	C ₂ H ₅ + CH ₃	12.04±0.08	EI	5311
CH₄OS⁺						
	C ₂ H ₅ SOCH ₃	1669-98-3	C ₂ H ₄	10.00±0.11	EI	5311
	(iso-C ₃ H ₇)SOCH ₃	XXXXX-XX-X	C ₃ H ₆	9.28±0.03	EI	5311
C₂H₄OS⁺						
	CH ₃ COSH	507-09-5	**	10.06 (V)	PE	4769
	C ₂ H ₄ SO	7117-41-1	**	9.66 (V)	PE	3646
	(Thiirane, 1-oxide)		**	9.66 (V)	PE	4295
C₂H₆OS⁺						
	(CH ₃) ₂ SO	67-68-5	**	9.01 (V)	PE	3646
			**	9.01 (V)	PE	4295
			**	9.11 (V)	PE	3705

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_2H_6OS^+$	$(CH_3)_2SO$	67-68-5	**	9.08 ± 0.09	EI	5311
			**	9.20	EI	5292
			**	9.20 ± 0.05	EI	3498
	$(C_2H_5)_2SO$	70-29-1	C_2H_4	9.86 ± 0.08	EI	5311
$C_3H_5OS^+$	C_3H_6OS (1,3-Oxathiolane)	2094-97-5	H	10.8 ± 0.1	EI	3598
$C_3H_6OS^+$	$CH_3C=OSCH_3$	1534-08-3	**	9.65 (V)	PE	4427
	$C_2H_5S(CH_3)O$	10258-86-3	**	9.02 (V)	PE	4295
	C_3H_6OS (1,3-Oxathiolane)	2094-97-5	**	9 ± 0.05	EI	3598
$C_3H_8OS^+$	$C_2H_5SOCH_3$	1669-98-3	**	8.89 ± 0.08	EI	5311
$C_4H_4OS^+$	$C_4H_4S(=O)$ (2(5H)-Thiophenone)	3354-32-3	**	9.78 ± 0.05	EI	4666
$C_4H_8OS^+$	$CH_3COSC_2H_5$	625-60-5	**	9.44 (V)	PE	4769
	$CH_3C=SOC_2H_5$	926-67-0	**	8.82 (V)	PE	4427
	C_4H_8OS (1,4-Oxathiane)	15980-15-1	**	8.67 (V)	PE	3733
	$C_2H_5SCH_2OCH_3$ (Thiirane, methoxymethyl-)	19858-14-1	**	8.77 (V)	PE	4747
	C_4H_8SO (Thiophene, tetrahydro-1-oxide)	1600-44-8	**	8.77 (V)	PE	3646
			**	8.77 (V)	PE	4295
			**	9.07 ± 0.05	EI	3498
			**	9.07	EI	5292
$C_4H_{10}OS^+$	$(CH_3CH_2)_2SO$	70-29-1	**	8.76 (V)	PE	3646
			**	8.76 (V)	PE	4295
			**	8.75 ± 0.03	EI	5311
	$(iso-C_3H_7)SOCH_3$	XXXXX-XX-X	**	8.71 ± 0.04	EI	5311
	$(iso-C_3H_7)_2SO$	2211-89-4	C_3H_6	9.22 ± 0.18	EI	5311
$C_5H_3OS^+$	$C_6H_5COC_4H_3S$ (Methanone, phenyl-2-thienyl-)	135-00-2	C_6H_5	11.8 ± 0.1	EI	5493
$C_5H_4OS^+$	$C_5H_4O(=S)$ (4H-Pyran-4-thione)	1120-93-0	**	8.10 ± 0.05 (V)	PE	5002
	C_6H_5SCHO (2-Thiophene carboxaldehyde)	98-03-3	**	9.37 ± 0.05 (V)	PE	4626
			**	9.55 ± 0.05	EI	3482
	$C_5H_4S(=O)$ (4H-Thiopyran-4-one)	1003-41-4	**	8.97 ± 0.05 (V)	PE	5002
$C_5H_6OS^+$	$C_4H_5S(OCH_3)$ (Thiophene, 2-methoxy-)	16839-97-7	**	8.14 ± 0.05	EI	4666
			**	8.30 ± 0.05	EI	3482
			**	8.08	CTS	4382
	$C_4H_5OSCH_3$ (Furan, 2-(methylthio)-)	13129-38-9	**	8.58 ± 0.05 (V)	PE	4626

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₅H₆OS⁺	C ₄ H ₅ O(SH)CH ₃ (2-Furanthiol, 5-methyl-)	60965-60-8	**	8.45±0.05	EI	4706
	C ₄ H ₅ S(=O)(CH ₃) (2(5H)-Thiophenone, 3-methyl-)	33687-85-3	**	9.60±0.05	EI	4666
	C ₄ H ₅ S(=O)(CH ₃) (2(5H)-Thiophenone, 5-methyl-)	7210-64-2	**	9.16±0.05	EI	4666
C₅H₈OS⁺	C ₅ H ₈ S(=O) (4H-Thiopyran-4-one, tetrahydro-)	1072-72-6	**	8.90±0.05	PE	5002
C₅H₁₂OS⁺	C ₂ H ₅ S(CH ₂) ₂ OCH ₃	56444-81-6	**	8.33±0.02	PI	5531
C₆H₆OS⁺	C ₄ H ₇ SCOCH ₃ (Ethanone, 1-(2-thienyl)-)	88-15-3	**	9.20±0.05	EI	3482
	C ₄ H ₇ SCOCH ₃ (Ethanone, 1-(3-thienyl)-)	1468-83-3	**	9.32±0.05	EI	3482
C₆H₈OS⁺	C ₄ H ₇ S(CH ₃)(OCH ₃) (Thiophene, 2-methoxy-3-methyl-)	33687-87-5	**	8.05±0.05	EI	4666
	C ₄ H ₇ S(CH ₃)(OCH ₃) (Thiophene, 2-methoxy-5-methyl-)	31053-55-1	**	8.01±0.05	EI	4666
	C ₄ H ₇ O(CH ₃)SCH ₃ (Furan, 2-methyl-5-(methylthiol)-)	13678-59-6	**	8.15±0.05	EI	4706
	C ₃ HO(SH)(CH ₃) ₂ (3-Furanthiol, 2,5-dimethyl-)	55764-23-3	**	8.23±0.05	EI	4706
	C ₄ H ₇ S(=O)(CH ₃) ₂ (2(3H)-Thiophenone, 3,3-dimethyl-)	33687-82-0	**	8.77±0.05	EI	4666
	C ₄ H ₇ S(=O)(CH ₃) ₂ (2(5H)-Thiophenone, 3,4-dimethyl-)	33922-75-7	**	9.44±0.05	EI	4666
	C ₄ H ₇ S(=O)(CH ₃) ₂ (2(5H)-Thiophenone, 3,5-dimethyl-)	33687-84-2	**	9.35±0.05	EI	4666
	C ₄ H ₇ S(=O)(CH ₃) ₂ (2(5H)-Thiophenone, 4,5-dimethyl-)	35983-76-7	**	9.13±0.05	EI	4666
	C ₄ H ₇ S(=O)(CH ₃) ₂ (3(2H)-Thiophenone, 2,5-dimethyl-)	3760-59-6	**	8.55±0.05	EI	4673
	C ₄ H ₇ S(=O)(C ₂ H ₅) (2(5H)-Thiophenone, 5-ethyl-)	56761-30-9	**	9.08±0.05	EI	4666
C₆H₁₁OS⁺	C ₄ H ₉ OS(CH ₃) ₃ (1,3-Oxathiane, 2,4,6-trimethyl-, (2 α ,4 α ,6 α)-)	22521-88-6	CH ₃	8.54±0.01	EI	3803
	C ₄ H ₉ OS(CH ₃) ₃ (1,3-Oxathiane, 2,4,6-trimethyl-, (2 α ,4 α ,6 β)-)	22425-91-8	CH ₃	8.67	EI	3803
	C ₄ H ₉ OS(CH ₃) ₃ (1,3-Oxathiane, 2,4,6-trimethyl-, (2 α ,4 β ,6 α)-)	22425-90-7	CH ₃	8.64	EI	3803
C₆H₁₂OS⁺	C ₄ H ₉ OS(CH ₃) ₂ (1,3-Oxathiane, 4,6-dimethyl-, <i>cis</i> -)	22452-25-1	**	8.75	EI	3803
	C ₄ H ₉ OS(CH ₃) ₂ (1,3-Oxathiane, 4,6-dimethyl-, <i>trans</i> -)	22452-26-2	**	8.67±0.01	EI	3803
C₆H₁₁OS⁺	(<i>n</i> -C ₃ H ₇) ₂ SO	4253-91-2	**	8.60 (V)	PE	4295
	(<i>iso</i> -C ₃ H ₇) ₂ SO	2211-89-4	**	8.46 (V)	PE	4295
			**	8.46 (V)	PE	3646
			**	8.54±0.08	EI	5311

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₆H₁₁OS⁺	(iso-C ₅ H ₁₁)SOCH ₃	55860-10-1	**	8.55±0.05	EI	5311
C₇H₈OS⁺	C ₆ H ₅ S(CH ₃)O (Benzene, (methylsulfinyl)-)	1193-82-4	**	8.79 (V)	PE	4295
C₇H₁₀OS⁺	C ₄ HS(CH ₃) ₂ (OCH ₃) (Thiophene, 2-methoxy-3,5-dimethyl-)	57556-17-9	**	7.78±0.05	EI	4666
	C ₄ HO(CH ₃) ₂ SCH ₃ (Furan, 2,5-dimethyl-3-(methylthiol)-)	63359-63-7	**	7.91±0.05	EI	4706
	C ₄ HS(CH ₃) ₂ OCH ₃ (Thiophene, 3-methoxy-2,5-dimethyl-)	57556-08-8	**	7.89±0.05	EI	4673
	C ₄ H ₂ S(=O)(CH ₃)C ₂ H ₅ (3(2H)-Thiophenone, 2-ethyl-5-methyl-)	57556-06-6	**	8.22±0.05	EI	4673
	C ₄ H ₂ S(=O)(CH ₃)C ₂ H ₅ (3(2H)-Thiophenone, 5-ethyl-2-methyl-)	57556-03-3	**	8.34±0.05	EI	4673
	C ₄ HS(=O)(CH ₃) ₃ (2(3H)-Thiophenone, 3,3,5-trimethyl-)	33687-83-1	**	8.53±0.05	EI	4666
	C ₄ HS(=O)(CH ₃) ₃ (3(2H)-Thiophenone, 2,2,5-trimethyl-)	57556-09-9	**	8.49±0.05	EI	4673
C₇H₁₃OS⁺	C ₄ H ₄ OS(CH ₃) ₄ (1,3-Oxathiane, 2,2,4,6-tetramethyl-, <i>cis</i> -)	34560-79-7	CH ₃	8.63±0.01	EI	3803
	C ₄ H ₄ OS(CH ₃) ₄ (1,3-Oxathiane, 2,2,4,6-tetramethyl, <i>trans</i> -)	34560-78-6	CH ₃	8.54±0.01	EI	3803
C₇H₁₄OS⁺	C ₄ H ₅ OS(CH ₃) ₃ (1,3-Oxathiane, 2,4,6-trimethyl-, (2 α ,4 α ,6 α)-)	22521-88-6	**	8.55	EI	3803
	C ₄ H ₅ OS(CH ₃) ₃ (1,3-Oxathiane, 2,4,6-trimethyl-, (2 α ,4 α ,6 β)-)	22425-91-8	**	8.54	EI	3803
	C ₄ H ₅ OS(CH ₃) ₃ (1,3-Oxathiane, 2,4,6-trimethyl-, (2 α ,4 β ,6 α)-)	22425-90-7	**	8.58	EI	3803
C₈H₁₀OS⁺	C ₆ H ₄ (SCH ₃)(OCH ₃) (Benzene, 1-methoxy-2-(methylthio)-)	2388-73-0	**	8.05 (V)	PE	5403
	C ₆ H ₄ (SCH ₃)(OCH ₃) (Benzene, 1-methoxy-4-(methylthio)-)	1879-16-9	**	7.80 (V)	PE	5403
			**	7.80±0.01 (V)	PE	4389
C₈H₁₂OS⁺	C ₄ H ₅ S(=O)(<i>tert</i> -C ₄ H ₉) (2(5H)-Thiophenone, 3-(2,2-dimethylethyl)-)	XXXXX-XX-X	**	9.25±0.05	EI	4666
	C ₆ H ₁₂ OS (3(2H)-Thiophenone, 2-methyl-5-(1-methylethyl)-)	57556-04-4	**	8.21±0.05	EI	4673
C₈H₁₆OS⁺	C ₄ H ₄ OS(CH ₃) ₄ (1,3-Oxathiane, 2,2,4,6-tetramethyl-, <i>cis</i> -)	34560-79-7	**	8.48±0.02	EI	3803
	C ₄ H ₄ OS(CH ₃) ₄ (1,3-Oxathiane, 2,2,4,6-tetramethyl, <i>trans</i> -)	34560-78-6	**	8.45±0.01	EI	3803
C₈H₁₈OS⁺	((CH ₃) ₃ C) ₂ SO	2211-92-9	**	8.18 (V)	PE	3646
			**	8.18 (V)	PE	4295
C₉H₆OS⁺	C ₆ H ₄ C ₃ H ₂ S(=O) (4H-1-Benzothiopyran-4-one)	491-39-4	**	8.68 (V)	PE	5491

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_9H_8OS^+$	$C_9H_7C_3H_4S(=O)$ (4H-1-Benzothiopyran-4-one,2,3-dihydro-)	3528-17-4	**	8.53 (V)	PE	5491
$C_9H_{14}OS^+$	$C_9H_{14}OS$ (Thiophene, 3-(1,1-dimethylethyl)-2-methoxy-) $C_9H_{14}OS$ (2(3H)-Thiophenone, 3-(1,1-dimethylethyl)-3-methyl-) $C_9H_{14}OS$ (2(5H)-Thiophenone, 3-(1,1-dimethylethyl)-5-methyl-) $C_9H_{14}OS$ (3(2H)-Thiophenone, 2-(1,1-dimethylethyl)-5-methyl-) $C_9H_{14}OS$ (3(2H)-Thiophenone, 5-(1,1-dimethylethyl)-2-methyl-)	57556-16-8	**	7.67 ± 0.05	EI	4666
		57556-18-0	**	8.38 ± 0.05	EI	4666
		57556-15-7	**	9.07 ± 0.05	EI	4666
		57556-07-7	**	8.09 ± 0.05	EI	4673
		57556-05-5	**	8.10 ± 0.05	EI	4673
$C_{11}H_8OS^+$	$C_6H_5COC_3H_4S$ (Methanone, phenyl-2-thienyl-)	135-00-2	**	9.2 ± 0.1	EI	5493
$C_{12}H_8OS^+$	$C_{12}H_8SO$ (Dibenzothiophene, 5-oxide)	1013-23-6	**	8.43 (V)	PE	4295
	$C_{12}H_8OS$ (Phenoxathiin)	262-20-4	**	7.72 ± 0.05 (V)	PE	4743
$C_{12}H_{10}OS^+$	$(C_6H_5)_2SO$	945-51-7	**	9.02 ± 0.05	EI	3498
			**	8.58 (V)	PE	4295
			**	9.02	EI	5292
$C_{12}H_{12}OS^+$	$C_6H_4(C_2H_4SO)C_6H_4$ (4 α ,8 α -(Methanothiomethano)naphthalene-10-oxide)	64776-55-2	**	8.44 (V)	PE	5194
$C_{12}H_{16}OS^+$	$C_6H_4(C_2H_4SO)C_6H_8$ (4 α ,8 α -(Methanothiomethano)naphthalene,1,2,3,4-tetrahydro-10-oxide)	71656-72-9	**	8.71 (V)	PE	5194
	$C_6H_4(C_2H_4SO)C_6H_6$ (4 α ,8 α -(Methanothiomethano)naphthalene,1,4,5,8-tetrahydro-10-oxide)	17853-53-1	**	8.52 (V)	PE	5194
$C_{12}H_{18}OS^+$	$C_6H_4(C_2H_4SO)C_6H_8$ (4 α ,8 α -(Methanothiomethano)naphthalene,1,2,3,4,5,8-hexahydro-10-oxide)	71600-20-9	**	8.50 (V)	PE	5194
$C_{13}H_8OS^+$	$C_{13}H_7(=O)SH$ (Phenalen-1-one,9-mercapto-)	XXXXX-XX-X	**	7.76 ± 0.04 (V)	PE	5595
$C_{13}H_{12}OS^+$	$C_6H_4(OCH_3)SC_6H_5$ (Benzene, 1-methoxy-3-(phenylthio)-)	30723-54-7	**	8.02	CTS	4272
	$C_6H_4(OCH_3)SC_6H_5$ (Benzene, 1-methoxy-4-(phenylthio)-)	5633-57-8	**	7.89	CTS	4272
$C_{14}H_9OS^+$	$(C_6H_4)_2CH_2SC(=O)$ (Dibenzo[b,e]thiepin-11(6H)-one)	1531-77-7	H	10.4	EI	5340
$C_{14}H_{10}OS^+$	$(C_6H_4)_2CH_2SC(=O)$ (Dibenzo[b,e]thiepin-11(6H)-one)	1531-77-7	**	9.21	EI	5340

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method •	Ref.
$C_{11}H_{10}OS^+$	$C_2S(=O)(C_6H_5)_2$ (Thiirene, diphenyl-1-oxide)	31247-21-9	**	10.86 (V)	PE	4856
$C_{11}H_{11}OS^+$	$C_{14}H_{12}SO_2$ (Dibenzo[<i>b,e</i>]thiepin, 6,11-dihydro-5,5-dioxide-)	23772-26-1	OH	10.30	EI	5414
$C_{11}H_{11}OS^+$	$C_6H_5O(CH_2)_2SC_6H_5$ (Benzene, [(2-phenoxyethyl)thio]-)	17414-04-9	**	8.20 ± 0.05	EI	5484
$C_{15}H_{16}OS^+$	$C_6H_5O(CH_2)_3SC_6H_5$ (Benzene, [(3-phenoxypropyl)thio]-)	59950-10-6	**	8.21 ± 0.05	EI	5484
$C_{16}H_{18}OS^+$	$C_6H_5O(CH_2)_4SC_6H_5$ (Benzene, [(4-phenoxybutyl)thio]-)	59950-11-7	**	8.25 ± 0.05	EI	5484
$C_{17}H_{20}OS^+$	$C_6H_5O(CH_2)_5SC_6H_5$ (Benzene, [(5-phenoxypentyl)thio]-)	59950-12-8	**	8.27 ± 0.05	EI	5484
$C_{18}H_{22}OS^+$	$C_6H_5O(CH_2)_6SC_6H_5$ (Benzene, [(6-phenoxyhexyl)thio]-)	59950-13-9	**	8.26 ± 0.05	EI	5484
$C_2H_4O_2S^+$	$C_2H_4SO_2$ (Thiirane 1,1-dioxide)	1782-89-4	**	10.20 (V)	PE	4827
$C_2H_6O_2S^+$	$(CH_3)_2SO_2$	67-71-0	**	10.65 (V)	PE	4827
			**	10.65 (V)	PE	5207
			**	10.80 (V)	PE	3993
			**	10.97 (V)	PE	3705
$C_3H_2O_2S^+$	$C_3H_2O_2(=S)$ (1,3-Dioxole-2-thione)	37635-87-3	**	9.05 (V)	PE	4549
$C_3H_4O_2S^+$	$C_2HS(O_2)(CH_3)$ (Thiirene, methyl-1,1-dioxide-)	14491-01-1	**	10.40 (V)	PE	4508
	$C_3H_4O_2(=S)$ (1,3-Dioxolane-2-thione)	20628-59-5	**	8.88 (V)	PE	4549
$C_3H_6O_2S^+$	$(CH_3O)_2CS$	1115-13-5	**	8.99 (V)	PE	4323
	$(CH_3)(CH_2=CH)SO_2$	3680-02-2	**	10.65 (V)	PE	4827
			**	10.82 (V)	PE	3993
$C_4H_6O_2S^+$	$(CH_2=CH)_2SO_2$	77-77-0	**	10.56 (V)	PE	4827
			**	10.62 (V)	PE	3993
	$C_2S(O_2)(CH_3)_2$ (Thiirene, dimethyl-1,1-dioxide-)	30646-57-2	**	9.89 (V)	PE	4508
	$C_4H_6SO_2$	77-79-2	**	10.44 (V)	PE	4827
	(Thiophene, 2,5-dihydro-1,1-dioxide)		**	10.44 (V)	PE	5207

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₄H₈O₂S⁺	C ₂ H ₂ S(O ₂)(CH ₃) ₂ (Thiirane, 2,3-dimethyl-1,1-dioxide, <i>cis</i> -)	54697-52-8	**	9.82 (V)	PE	4508
	C ₄ H ₈ SO ₂ (Thiophene, tetrahydro-1,1-dioxide)	126-33-0	**	9.91±0.07	PI	5040
			**	10.24 (V)	PE	4324
C₄H₁₀O₂S⁺	(C ₂ H ₅) ₂ SO ₂	597-35-3	**	9.96±0.03	PI	5040
C₅H₄O₂S⁺	C ₅ H ₄ SO ₂ ([1,2]Oxathiolo[2,3- <i>b</i>][1,2]oxathiole-7-S ^{IV})	40159-76-0	**	8.58 (V)	PE	4406
	C ₅ H ₃ SCOOH (2-Thiophenecarboxylic acid)	527-72-0	**	9.14±0.05 (V)	PE	4626
			**	9.35	EI	3804
C₅H₆O₂S⁺	C ₅ O ₂ (=S)(CH ₃) ₂ (1,3-Dioxole-2-thione, 4,5-dimethyl-)	37528-00-0	**	8.4 (V)	PE	4549
C₆H₆O₂S⁺	C ₆ H ₅ SCOOCH ₃ (2-Thiophenecarboxylic acid methyl ester)	5380-42-7	**	8.98±0.05 (V)	PE	4626
			**	9.22±0.05	EI	3482
C₇H₈O₂S⁺	(C ₆ H ₅)(CH ₃)SO ₂ (Benzene, (methylsulfonyl)-)	3112-85-4	**	9.74 (V)	PE	4827
C₈H₄O₂S⁺	C ₈ H ₄ S(=O) ₂ (Benzol[<i>b</i>]thiophene-2,3-dione)	493-57-2	**	9.14±0.05 (V)	PE	4708
	C ₈ H ₄ S(=O) ₂ (Benzol[<i>c</i>]thiophene-1,3-dione)	5698-59-9	**	9.85±0.05 (V)	PE	4708
C₈H₁₈O₂S⁺	(iso-C ₄ H ₉) ₂ SO ₂	10495-45-1	**	9.54±0.05	PI	5040
C₉H₆O₂S⁺	C ₉ H ₄ C ₃ H ₂ S(=O) ₂ 5491 (4H-1-Benzothiopyran-4-one-1-oxide)	37682-92-1	**	9.24 (V)	PE	5491
C₉H₁₂O₂S⁺	(C ₆ H ₅)(n-C ₃ H ₇)SO ₂ (Benzene, (propylsulfonyl)-)	13596-75-3	**	9.21±0.03	PI	5040
C₁₀H₁₆O₂S⁺	C ₆ H ₄ S(=O) ₂ (CH ₃) ₄ (1,2-Cycloheptanedione-7-thia,3,3,7,7-tetramethyl-)	XXXXX-XX-X	**	8.75 (V)	PE	5090
C₁₁H₁₀O₂S⁺	C ₆ H ₄ C ₃ O ₂ S(CH ₃) ₂ (Sulfonium, dimethyl-2,3-dihydro-1,3-dioxo-1H-inden-2-ylide)	5508-42-9	**	8.05	CTS	5592
C₁₂H₈O₂S⁺	C ₁₂ H ₈ SO ₂ (Dibenzothiophene 5,5-dioxide)	1016-05-3	**	8.90 (V)	PE	4827
			**	9.28	EI	4228

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{12}H_{10}O_2S^+$	$(C_6H_5)_2SO_2$ (Benzene, 1,1'-sulfonylbis-)	127-63-9	**	9.16 ± 0.03	PI	5040
			**	9.37 (V)	PE	4827
			**	9.7	EI	4228
$C_{12}H_{12}O_2S^+$	$C_6H_5(C_2H_5SO_2)C_4H_9$ (4 α ,8 α -(Methanothiomethano)naphthalene-10,10-dioxide)	23695-63-8	**	8.7 (V)	PE	5194
$C_{12}H_{16}O_2S^+$	$C_6H_5(C_2H_5SO_2)C_4H_9$ (4 α ,8 α -(Methanothiomethano)naphthalene,1,4,5,8-tetrahydro-10,10-dioxide)	17853-54-2	**	9.2 (V)	PE	5194
$C_{12}H_{20}O_2S^+$	$C_4H_9S(C_4H_9)_2O_2$ (Thiophene, 2,5-bis(1,1-dimethylethyl)- 1,1-dioxide)	6407-02-9	**	8.64 (V)	PE	4324
$C_{14}H_9O_2S^+$	$C_6H_5(COSC_6H_5)_2$ (1,2-Benzenedicarbothioic acid <i>S,S</i> -diphenyl ester)	42797-33-1	C_6H_5S	10.3 ± 0.2	EI	4062
	$C_6H_5O(=O)(SC_6H_5)_2$ (1(3 <i>H</i>)-Isobenzofuranone, 3,3-bis(phenylthio)-)	4792-31-8	C_6H_5S	10.3 ± 0.2	EI	4062
$C_{14}H_{12}O_2S^+$	$C_{14}H_{12}SO_2$ (Dibenzo[<i>b,e</i>]thiepin,6,11-dihydro-5,5-dioxide-)	23772-26-1	**	9.85	EI	5414
$C_{14}H_{14}O_2S^+$	$(C_6H_4CH_3)_2SO_2$ (Benzene, 1,1'-sulfonylbis[4-methyl-])	599-66-6	**	8.66 ± 0.04	PI	5040
$C_{15}H_{11}O_2S^+$	$C_6H_5(COSC_6H_4CH_3)_2$ (1,2-Benzenedicarbothioic acid <i>S,S</i> -bis(4-methylphenyl)ester)	42797-34-2	$C_6H_5(S)CH_3$	10.1 ± 0.2	EI	4062
	$C_6H_5O(=O)(SC_6H_4CH_3)_2$ (1(3 <i>H</i>)-Isobenzofuranone, 3,3-bis[(4-methylphenyl)thio]-)	42797-36-4	$C_6H_5(S)CH_3$	9.9 ± 0.2	EI	4062
$C_2H_4O_3S^+$	$SO(OCH_2)_2$	3741-38-6	**	10.30	EI	5292
			**	10.93 (V)	PE	3646
			**	10.93 (V)	PE	4295
			**	10.30 ± 0.05	EI	3498
$C_2H_6O_3S^+$	$(CH_3O)_2SO$	616-42-2	**	10.25 (V)	PE	3646
			**	10.25 (V)	PE	4295
$C_6H_5O_3S^+$	$C_6H_5O_3S$ (1,3,2-Benzodioxathiole-2-oxide)	6255-58-9	**	9.1 (V)	PE	4616
$C_9H_6O_3S^+$	$C_6H_5C_3H_2S(=O)_2$ (4 <i>H</i> -1-Benzothiopyran-4-one-1,1-dioxide)	22810-27-1	**	9.93 (V)	PE	5491
$C_{14}H_{10}O_3S^+$	$C_{14}H_{10}SO_3$ (Dibenzo[<i>b,e</i>]thiepin-11(6 <i>H</i>)-one-5,5-dioxide)	33301-21-2	**	9.70	EI	5414
$C_{16}H_{21}O_4S^+$	$C_{16}H_{21}S(O)(CH_2)_8$ (Spiro[furan-3(2 <i>H</i>),2'-furo[3,4- <i>d</i>][1,3]oxathiol]-4(5 <i>H</i>)-one, 4',6'-dihydro-2,2,4',4',5,5,6',6'-octamethyl-)	54196-16-6	**	7.48 ± 0.03 (V)	PE	4292

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{16}H_{26}O_1S^+$	$C_8H_9S_2(OH)(CH_3)_8$ (Spiro[furan-3(2H),2'-furo[3,4-d][1,3]oxathiol]-4-ol, 4,4',5,6'-tetrahydro-2,2,4',4',5,5,6',6'-octamethyl-)	54739-35-4	**	7.47 ± 0.03 (V)	PE	4292
$C_3H_1OS_2^+$	$C_3H_4S_2O$ (1,3-Dithiolan-2-one)	2080-58-2	**	9.50 (V)	PE	4407
			**	9.58 (V)	PE	4549
$C_3H_6OS_2^+$	$CH_3SCSOCH_3$	19708-81-7	**	8.71 (V)	PE	4323
$C_7H_8OS_2^+$	$C_5H_2S_2O(CH_3)_2$ (2-Propanone,1-(5-methyl-3H-1,2-dithiol-3-ylidene)-)	1005-55-6	**	7.68 (V)	PE	4406
$C_{10}H_8OS_2^+$	$(C_4H_2S)_2C_2H_4O$ (4H,6H-Dithieno[3,4-c:3',4'-e]oxepin)	23062-34-2	**	8.3 (V)	PE	5422
	$(C_4H_2S)_2C_2H_4O$ (Dithieno[2,3-c:3',2'-e]oxepin,4,6-dihydro-)	63286-53-3	**	8.15 (V)	PE	5422
$C_{11}H_{16}OS_2^+$	$(C_4H_2S)_2C_2(CH_3)_4O$ (Dithieno[2,3-c:3',2'-e]oxepin,4,6-dihydro-4,4,6,6-tetramethyl-)	64504-71-8	**	7.8 (V)	PE	5422
	$(C_4H_2S)_2C_2(CH_3)_4O$ (4H,6H-Dithieno[3,4-c:3',4'-e]oxepin,4,4,6,6-tetramethyl-)	64504-72-9	**	8.0 (V)	PE	5422
$C_6H_6O_2S_2^+$	$C_4(=O)_2(CH_3S)_2$ (3-Cyclobutene-1,2-dione, 3,4-bis(methylthio)-)	54131-97-4	**	8.18 (V)	PE	4861
$C_8H_{11}O_2S_2^+$	$C_3H_5S_2(CH_2)_4COOH$ (1,2-Dithiolane-3-pentanoic acid)	62-46-4	**	8.02 (V)	PE	4410
$C_{10}H_8OS_3^+$	$(C_4HS)_2 = S(C_6H_4OCH_3)$ (3H-1,2-Dithiole-3-thione, 5-(4-methoxyphenyl)-)	532-11-6	**	8.11 (V)	PE	4403
$C_8H_4O_2S_3^+$	$C_8H_4S_2(SO_2)$ (Dithieno[2,3-b:3',2'-d]thiophene,7,7-dioxide-)	28504-86-1	**	8.5 (V)	PE	5405
	$C_8H_4S_2(SO_2)$ (Dithieno[3,2-b:2',3'-d]thiophene,4,4-dioxide-)	3807-53-2	**	8.4 (V)	PE	5405
	$C_8H_4S_2(SO_2)$ (Dithieno[3,4-b:3',4'-d]thiophene,4,4-dioxide-)	28504-85-0	**	8.7 (V)	PE	5405
$BC_{13}H_{21}OS^+$	$C_{13}H_{21}BOS$ (Borinic acid, dipropylthio-4-methoxyphenyl ester)	64503-45-3	**	8.17 ± 0.05 (V)	PE	4848
$HNOS^+$	$HN=S=O$	13817-04-4	**	11.60 (V)	PE	5386
$C_2H_7NOS^+$	$(CH_3)_2S(NH)O$	1520-31-6	**	9.5 (V)	PE	5207
			**	9.50 (V)	PE	4827
$C_3H_5NOS^+$	$C_3H_5NO=S$ (2-Oxazolidinethione)	5840-81-3	**	8.37 ± 0.03 (V)	PE	4253

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₄H₃NOS⁺	C ₃ H ₂ NS(CHO) (5-Isothiazolecarboxaldehyde)	5242-57-9	**	10.25	EI	3587
C₄H₉NOS⁺	(CH ₃) ₃ CNSO	38662-39-	**	10.54 (V)	PE	4024
C₅H₇NOS⁺	C ₃ HNO(=S)(CH ₃) ₂ (2(3 <i>H</i>)-Oxazolethione, 4,5-dimethyl-)	6670-14-0	**	7.74±0.03 (V)	PE	4253
C₆H₇NOS⁺	C ₅ H ₂ NH(=S)(OH)CH ₃ (2(1 <i>H</i>)-Pyridinethione, 3-hydroxy-6-methyl-)	22989-67-9	**	8.04±0.05	EI	3635
	C ₅ H ₃ N(OH)SCH ₃ (3-Pyridinol, 2-(methylthio)-)	32637-37-9	**	8.53±0.05	EI	3977
C₆H₉NOS⁺	C ₃ NO(S)(CH ₃) ₃ (2(3 <i>H</i>)-Oxazolethione, 3,4,5-trimethyl-)	25444-93-3	**	7.51	PE	4555
			**	7.54±0.03 (V)	PE	4253
C₆H₁₁NOS⁺	C ₆ H ₁₁ NSO (Cyclohexanamine, <i>N</i> -sulfinyl-)	30980-11-1	**	10.0 (V)	PE	4024
C₇H₅NOS⁺	C ₇ H ₅ NO(S) (2(3 <i>H</i>)-Benzoxazolethione)	2382-96-9	**	8.14	PE	4555
	C ₇ H ₅ NS(O) (Thiazolo[3,2- <i>a</i>]pyridinium, 3-hydroxy-, hydroxide, inner salt)	42715-25-3	**	6.92±0.05	EI	3977
C₇H₇NOS⁺	C ₅ H ₃ N(O)SC ₂ H ₄ (Thiazolo[3,2- <i>a</i>]pyridinium, 2,3-dihydro-8-hydroxy-hydroxide, inner salt)	23003-45-4	**	7.12±0.05	EI	5416
	C ₅ H ₃ N(=O)SC ₂ H ₄ (5 <i>H</i> -Thiazolo[3,2- <i>a</i>]pyridin-5-one, 2,3-dihydro-)	66201-75-0	**	7.91±0.05	EI	5416
C₇H₉NOS⁺	C ₅ H ₂ N(OH)(CH ₃)SCH ₃ (3-Pyridinol, 6-methyl-2-(methylthio)-)	23003-25-0	**	8.24±0.05	EI	3635
	C ₄ H ₃ SCON(CH ₃) ₂ (2-Thiophenecarboxamide, <i>N,N</i> -dimethyl-)	30717-57-8	**	8.84±0.05 (V)	PE	4626
C₈H₇NOS⁺	C ₇ H ₄ NO(S)(CH ₃) (2(3 <i>H</i>)-Benzoxazolethione, 3-methyl-)	13673-63-7	**	7.94	PE	4555
	C ₅ H ₃ N(O)SC ₂ H(CH ₃) (Thiazolo[3,2- <i>a</i>]pyridinium, 8-hydroxy-3-methyl-hydroxide, inner salt)	30276-99-4	**	7.12±0.05	EI	5416
	C ₇ H ₄ NS(O)CH ₃ (Thiazolo[3,2- <i>a</i>]pyridinium, 3-hydroxy-2-methyl-, hydroxide, inner salt)	35143-56-7	**	6.82±0.05	EI	3977
	C ₇ H ₄ NS(O)CH ₃ (Thiazolo[3,2- <i>a</i>]pyridinium, 8-hydroxy-5-methyl-, hydroxide, inner salt)	30277-17-9	**	7.03±0.05	EI	3635
	C ₅ H ₃ N(=O)SC ₂ H(CH ₃) (5 <i>H</i> -Thiazolo[3,2- <i>a</i>]pyridin-5-one, 3-methyl-)	71310-14-0	**	7.44	EI	5416
C₈H₉NOS⁺	C ₇ H ₆ NOS(CH ₃) (1,4-Oxathiino[3,2- <i>b</i>]pyridine, 2,3-dihydro-6-methyl-)	35688-70-1	**	8.03±0.05	EI	3635
	C ₅ H ₂ (=O)(CH ₃)NC ₂ H ₄ S (Cyclopent[2,3]azirino[2,1- <i>b</i>]thiazol-7(4 <i>aH</i>)-one, 2,3-dihydro-4 <i>a</i> -methyl-)	71310-16-2	**	7.93	EI	5416

Table of Ion Energetics Measurements—Continued

Ion	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₈H₉NOS⁺						
	C ₇ H ₂ N(=S)(OH)(CH ₃)C ₂ H ₅ (2(1 <i>H</i>)-Pyridinethione, 1-ethenyl-3-hydroxy-6-methyl-)	35688-69-8	**	7.73±0.05	EI	3635
	C ₇ H ₂ N(O)(CH ₃)SC ₂ H ₄ (Thiazolo[3,2- <i>a</i>]pyridinium,2,3-dihydro-8-hydroxy-5-methyl- hydroxide, inner salt)	23003-43-2	**	6.95±0.05	EI	5416
	C ₇ H ₂ N(=O)(CH ₃)SC ₂ H ₄ (5 <i>H</i> -Thiazolo[3,2- <i>a</i>]pyridin-5-one,2,3-dihydro-8-methyl-)	71310-13-9	** **	7.35±0.05 7.69±0.05	EI EI	3635 5416
C₈H₁₁NOS⁺	C ₇ H ₂ N(=S)(OH)(CH ₃)C ₂ H ₅ (2(1 <i>H</i>)-Pyridinethione, 1-ethyl-3-hydroxy-6-methyl-)	24207-15-6	**	7.75±0.05	EI	3635
C₉H₉NOS⁺						
	C ₇ H ₂ N(O)(CH ₃)SC ₂ H(CH ₃) (Thiazolo[3,2- <i>a</i>]pyridinium,8-hydroxy-3,5-dimethyl- hydroxide, inner salt)	30277-00-0	**	6.84±0.05	EI	5416
	C ₇ H ₂ N(=O)(CH ₃)SC ₂ H(CH ₃) (5 <i>H</i> -Thiazolo[3,2- <i>a</i>]pyridin-5-one,3,8-dimethyl-)	71310-15-1	**	7.32	EI	5416
C₁₁H₁₁NOS⁺	C ₁₁ H ₁₁ NOS (Carbamothioic acid, 1,3-butadienyl-S-phenyl ester, (E)-)	61759-58-8	**	~8.18 (V)	PE	4803
C₁₃H₉NOS⁺	C ₇ H ₄ NS(O)C ₆ H ₅ (Thiazolo[3,2- <i>a</i>]pyridinium, 3-hydroxy-2-phenyl-, hydroxide, inner salt)	32044-03-4	**	6.70±0.05	EI	3977
C₄H₁₀N₂OS⁺	C ₂ H ₄ N ₂ S(O)(CH ₃) ₂ (1,2,5-Thiadiazolidine, 2,5-dimethyl-, 1-oxide)	15108-72-2	**	8.2 (V)	PE	4295
C₄H₁₂N₂OS⁺	((CH ₃) ₂ N) ₂ SO	3768-60-3	** **	8.53 (V) 8.53 (V)	PE PE	3646 4295
C₇H₈N₂OS⁺	C ₆ H ₃ (OH)NHCSNH ₂ (Thiourea, (2-hydroxyphenyl)-)	1520-26-9	**	8.20	EI	4834
C₈H₁₀N₂OS⁺	C ₆ H ₃ (OCH ₃)NHCSNH ₂ (Thiourea, (2-methoxyphenyl)-)	1516-37-6	**	7.80	EI	4834
C₁₅H₂₀N₂OS⁺						
	C ₁₅ H ₂₀ N ₂ OS (Carbamothioic acid,phenyl-0-(8-methyl-8-azabicyclo[3.2.1]oct-3-yl)ester, <i>endo</i> -)	67139-54-2	**	8±0.3	EI	5401
	C ₁₅ H ₂₀ N ₂ OS (Carbamothioic acid,phenyl-0-(8-methyl-8-azabicyclo[3.2.1]oct-3-yl)ester, <i>exo</i> -)	67139-55-3	**	8±0.3	EI	5401
C₁₇H₁₈N₂OS⁺	C ₁₂ H ₈ NSCOCH ₂ CH ₂ N(CH ₃) ₂ (10 <i>H</i> -Phenothiazine, 10-[3-(dimethylamino)-1-oxopropyl]-)	3576-44-1	**	8.26±0.07	CTS	4079
C₁₈H₂₂N₂OS⁺	C ₁₈ H ₂₂ N ₂ OS (10 <i>H</i> -Phenothiazine-10-ethanamine, 2-methoxy- <i>N,N</i> , α -trimethyl-)	7624-74-0	**	8.18±0.07	CTS	4079
C₁₉H₂₂N₂OS⁺	C ₁₂ H ₈ NSCOCH ₂ CH ₂ N(C ₂ H ₅) ₂ (10 <i>H</i> -Phenothiazine, 10-[3-(diethylamino)-1-oxopropyl]-)	3576-47-4	**	7.85±0.07	CTS	4079

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$\text{C}_{20}\text{H}_{21}\text{N}_2\text{OS}^+$	$\text{C}_{12}\text{H}_8\text{NSCO}(\text{CH}_2)_3\text{N}(\text{C}_2\text{H}_5)_2$ (10 <i>H</i> -Phenothiazine, 10-[4-(diethylamino)-1-oxobutyl]-)	51307-45-0	**	7.88 ± 0.07	CTS	4079
$\text{C}_6\text{H}_5\text{N}_3\text{OS}^+$	$\text{C}_7\text{H}_2\text{N}_3\text{SOCH}_3$ ([1,2,3]Thiadiazolo[5,4- <i>b</i>]pyridine, 5-methoxy-)	54459-90-4	**	9.01 ± 0.05	EI	4316
$\text{C}_{19}\text{H}_{23}\text{N}_3\text{OS}^+$	$\text{C}_{12}\text{H}_7\text{NS}(\text{CH}_3)\text{NHCOCH}_2\text{N}(\text{C}_2\text{H}_5)_2$ (Acetamide, 2-(diethylamino)- <i>N</i> -(10-methyl-10 <i>H</i> -phenothiazin-3-yl)-)	1952-62-1	**	7.13 ± 0.07	CTS	4079
$\text{C}_{22}\text{H}_{27}\text{N}_3\text{OS}^+$	$\text{C}_{22}\text{H}_{27}\text{N}_3\text{OS}$ (Ethanone, 1-[10-[3-(4-methyl-1-piperazinyl)propyl]-10 <i>H</i> -phenothiazin-2-yl]-)	1053-74-3	**	9.05 ± 0.07	CTS	4079
$\text{C}_{23}\text{H}_{29}\text{N}_3\text{OS}^+$	$\text{C}_{23}\text{H}_{29}\text{N}_3\text{OS}$ (1-Propanone, 1-[10-[3-(4-methyl-1-piperazinyl)propyl]-10 <i>H</i> -phenothiazin-2-yl]-)	20686-45-7	**	9.08 ± 0.07	CTS	4079
$\text{C}_3\text{H}_7\text{NO}_2\text{S}^+$	$\text{SHCH}_2\text{CH}(\text{NH}_2)\text{COOH}$	3374-22-9	**	~ 9	PI	3766
$\text{C}_7\text{H}_3\text{NO}_2\text{S}^+$	$\text{C}_7\text{H}_3\text{SNO}_2$ (Thiophene, 2-nitro-)	609-40-5	**	9.73 ± 0.05 (V)	PE	4626
			**	9.77 ± 0.05	EI	3482
$\text{C}_5\text{H}_{11}\text{NO}_2\text{S}^+$	$\text{CH}_3\text{SCH}_2\text{CH}_2\text{CH}(\text{NH}_2)\text{COOH}$	59-51-8	**	~ 9	PI	3766
$\text{C}_7\text{H}_3\text{NO}_2\text{S}^+$	$\text{C}_7\text{H}_3\text{NS}(=\text{O})_2$ (Thieno[3,4- <i>b</i>]pyridine-5,7-dione)	69094-37-7	**	10.05 ± 0.05 (V)	PE	4889
$\text{C}_7\text{H}_5\text{NO}_2\text{S}^+$	$\text{C}_7\text{H}_4\text{NS}(\text{O})\text{OH}$ (Thiazolo[3,2- <i>a</i>]pyridinium, 3,8-dihydroxy-, hydroxide, inner salt)	35143-55-6	**	8.70 ± 0.05	EI	3977
$\text{C}_7\text{H}_7\text{NO}_2\text{S}^+$	$\text{C}_6\text{H}_4(\text{NO}_2)\text{SCH}_3$ (Benzene, 1-(methylthio)-4-nitro-)	701-57-5	**	8.59 ± 0.01 (V)	PE	4389
$\text{C}_8\text{H}_7\text{NO}_2\text{S}^+$	$\text{C}_7\text{H}_3\text{NS}(\text{O})(\text{OH})\text{CH}_3$ (Thiazolo[3,2- <i>a</i>]pyridinium, 3,8-dihydroxy-2-methyl-, hydroxide, inner salt)	35191-20-9	**	8.60 ± 0.05	EI	3977
$\text{C}_8\text{H}_9\text{NO}_2\text{S}^+$	$\text{C}_5\text{H}_3\text{N}(\text{SCH}_3)\text{OCOCH}_3$ (3-Pyridinol, 2-(methylthio)- acetate (ester))	42715-30-0	**	7.91 ± 0.05	EI	3977
$\text{C}_{12}\text{H}_{19}\text{NO}_2\text{S}^+$	$\text{C}_{12}\text{H}_{19}\text{NO}_2\text{S}$ (Benzeneethanamine, 2,5-dimethoxy- α -methyl-4-(methylthio)-(\pm)-)	69519-59-1	**	7.64 ± 0.06 (V)	PE	4758
$\text{C}_{13}\text{H}_9\text{NO}_2\text{S}^+$	$\text{C}_7\text{H}_3\text{NS}(\text{O})(\text{OH})\text{C}_6\text{H}_5$ (Thiazolo[3,2- <i>a</i>]pyridinium, 3,8-dihydroxy-2-phenyl-, hydroxide, inner salt)	35143-57-8	**	8.42 ± 0.05	EI	3977
$\text{C}_{13}\text{H}_{13}\text{NO}_2\text{S}^+$	$\text{C}_7\text{H}_8\text{SO}_2\text{C}_6\text{H}_5$ (2-Azabicyclo[3.2.1]octa-3,6-diene,2-(phenylsulfonyl)-)	2063-88-9	**	8.11 (V)	PE	5481

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{13}H_{15}NO_2S^+$	$C_7H_{10}NSO_2C_6H_5$ (2-Azabicyclo[3.2.1]oct-3-ene,2-(phenylsulfonyl)-)	2063-89-0	**	8.18 (V)	PE	5481
	$C_7H_{10}NSO_2C_6H_5$ (2-Azabicyclo[3.2.1]oct-6-ene,2-(phenylsulfonyl)-)	71017-42-0	**	8.79	PE	5481
$C_{13}H_{17}NO_2S^+$	$C_7H_{12}NSO_2C_6H_5$ (2-Azabicyclo[3.2.1]octane,2-(phenylsulfonyl)-)	5503-65-1	**	8.72 (V)	PE	5481
$C_3H_2N_2O_2S^+$	$C_3H_2NS(NO_2)$ (Isothiazole, 4-nitro-)	931-07-7	**	10.45	PE	3587
$C_8H_6N_2O_2S^+$	$C_7H_5NS(NO_2)CH_3$ (Benzothiazole, 2-methyl-6-nitro-)	2941-63-1	**	9.15 (V)	PE	4437
$C_{12}H_{12}N_2O_2S^+$	$(C_6H_4NH_2)_2SO_2$ (Benzenamine, 4,4'-sulfonylbis-)	80-08-0	**	7.25 ± 0.05	PI	5040
			**	7.25	PI	4328
$C_{20}H_{24}N_2O_2S^+$	$C_{20}H_{24}N_2O_2S$ (Phenol, 2,2'-(thiobis(3,1-propanediyl nitrilomethylidene))bis-)	52279-44-4	**	8.51 ± 0.10	EI	4213
$C_7H_7N_3O_2S^+$	$C_6H_4(NO_2)NHCSNH_2$ (Thiourea, (2-nitrophenyl)-)	51039-84-0	**	8.30	EI	4834
$C_9H_{17}NO_3S^+$	$C_9H_{17}NO_3S$ (8-Azabicyclo[3.2.1]octan-3-ol,8-methyl-methanesulfonate(ester), <i>exo</i> -)	35136-87-9	**	7.7 ± 0.15	EI	5401
$C_{15}H_{11}NO_3S^+$	$C_7H_5NOS(OCOCH_3)C_6H_5$ (Thiazolo[3,2- <i>a</i>]pyridinium, 8-(acetyloxy)-3-hydroxy-2-phenyl-, hydroxide, inner salt)	32002-92-9	**	6.27 ± 0.05	EI	3977
$C_{15}H_{28}NO_3S^+$	$C_{26}H_{40}N_2O_7S$ (L-Tyrosine, N-[S-(2-methoxy-2-oxoethyl)-N-(1-oxodecyl)-L-cysteinyl]-methyl ester)	32886-16-1		8.7 ± 0.1	PI	5279
$C_{16}H_{28}NO_4S^+$	$C_{26}H_{40}N_2O_7S$ (L-Tyrosine, N-[S-(2-methoxy-2-oxoethyl)-N-(1-oxodecyl)-L-cysteinyl]-methyl ester)	32886-16-1		9.0 ± 0.1	PI	5279
$C_{26}H_{40}N_2O_7S^+$	$C_{26}H_{40}N_2O_7S$ (L-Tyrosine, N-[S-(2-methoxy-2-oxoethyl)-N-(1-oxodecyl)-L-cysteinyl]-methyl ester)	32886-16-1	**	8.3 ± 0.1	PI	5279
$C_{27}H_{40}N_4O_8S^+$	$C_{27}H_{40}N_4O_8S$ (L-Cysteine, S-(2-methoxy-2-oxoethyl)-N-[N-[N-(1-oxopropyl)-L-phenylalanyl]-L-leucyl]glycyl]-methyl ester)	35146-63-5	**	8.3 ± 0.1	PI	5279
$C_{22}H_{30}N_4O_2S_2^+$	$C_{22}H_{30}N_4O_2S_2$ (10 <i>H</i> -Phenothiazine-2-sulfonamide, <i>N,N</i> -dimethyl-10[3-(4-methyl-1-piperazinyl)propyl]-)	316-81-4	**	6.81 ± 0.07	CTS	4079
$B_2C_3H_9NOS^+$	$NB_2SO(CH_3)_3$ (1,3,5,2,4-Oxathiazadiborolidine, 2,4,5-trimethyl-)	57877-90-4	**	9.00 (V)	PE	4526

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.	
FS ⁺	SF	16068-96-5	**	10.0±0.3	EI	4580	
			**	10.0	EI	4544	
			**	10.09±0.10	EI	3818	
			**	10.2±0.3	EI	4864	
		37.6±3.0	EI	4645			
	F ₂ S ⁺	SF ₂	13814-25-0	**	10.08	PE	5073
**				10.29±0.10	EI	3818	
		27.5±0.5	EI	3818			
F ₃ S ⁺		SF ₄	7783-60-0	F	12.63±0.10	EI	3818
		SF ₆	2551-62-4		19.4±0.5	PI	4917
					19.6±0.5	EI	4645
	20.0±0.5				EI	3818	
F ₄ S ⁺	SF ₄	7783-60-0	**	12.03±0.05	EI	3578	
			**	12.08±0.10	EI	3818	
	2F	18.44±0.10	EI	3818			
			19.6±1.0	EI	4645		
	F ₅ S ⁺	SF ₆	2551-62-4		15.3±0.2	PI	4917
F				15.50±0.10	EI	3818	
F				16.2±0.2	EI	4645	
F ₆ S ⁺	SF ₆	2551-62-4	**	15.7	PE	5232	
FS ₂ ⁺	S ₂ F ₂	13709-35-8		14.0±0.4	EI	3738	
F ₂ S ₂ ⁺	S ₂ F ₂	13709-35-8	**	10.68 (V)	PE	4332	
			**	10.84 (V)	PE	4332	
			**	11.6±0.4	EI	3738	
CF ₂ S ⁺	F ₂ CS	420-32-6	**	10.45±0.01	PE	3708	
			**	10.52	PE	4080	
			**	10.64 (V)	PE	3746	
			**	10.53±0.10	EI	3818	
C ₂ F ₄ S ₂ ⁺	S=C(F)SCF ₃	371-73-3	**	10.12 (V)	PE	4345	
C ₃ F ₆ S ₃ ⁺	S=C(SCF ₃) ₂	461-08-5	**	9.25 (V)	PE	4345	
C ₁₀ F ₁₂ S ₄ ⁺	C ₆ S ₄ (CF ₃) ₄	26393-26-0	**	7.95 (V)	PE	4481	
	(1,3-Dithiole, 2-(4,5-di-trifluoromethyl-1,3-dithiol-2-ylidene)-4,5-di-trifluoromethyl-)						

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$\text{CH}_2\text{F}_1\text{S}^+$	$\text{CH}_2=\text{SF}_4$	66793-25-7	**	10.65 (V)	PE	4984
$\text{C}_9\text{H}_5\text{FS}_3^+$	$(\text{C}_3\text{HS}_2)=\text{S}(\text{C}_6\text{H}_4\text{F})$ (3H-1,2-Dithiole-3-thione, 5-(4-fluorophenyl)-)	54290-50-5	**	8.14 (V)	PE	4403
NFS^+	NSF	18820-63-8	**	11.49 ± 0.02	PE	3665
$(^2\text{A}')$				11.54 ± 0.01	PE	3666
$(^2\text{A}')$				11.82 (V)	PE	3660
$(^2\text{A}')$				13.382 ± 0.004	PE	3666
$(^2\text{A}')$				13.39 ± 0.02	PE	3665
$(^2\text{A}')$				13.50 (V)	PE	3660
$(^2\text{A}')$				13.775 ± 0.005	PE	3666
$(^2\text{A}')$				13.78 ± 0.02	PE	3665
$(^2\text{A}')$				13.87 (V)	PE	3660
$(^2\text{A}')$				14.93 ± 0.01	PE	3666
$(^2\text{A}')$				15.35 ± 0.02	PE	3665
$(^2\text{A}')$				15.61 (V)	PE	3660
$(^2\text{A}')$				16.56 ± 0.03 (V)	PE	3666
$(^2\text{A}')$				17.24 ± 0.08 (V)	PE	3666
$(^2\text{A}')$				21.1 ± 0.1 (V)	PE	3666
NF_3S^+	NSF_3	15930-75-3	**	12.50 (V)	PE	3660
$\text{C}_8\text{H}_8\text{NFS}^+$	$\text{C}_6\text{H}_4\text{FNHCSCH}_3$ (Ethanethioamide, N-(2-fluorophenyl)-)	39184-82-2	**	8.30	EI	4834
$\text{C}_7\text{H}_7\text{N}_2\text{FS}^+$	$\text{C}_6\text{H}_4\text{FNHCSNH}_2$ (Thiourea, (2-fluorophenyl)-)	656-32-6	**	8.15	EI	4834
$\text{C}_{21}\text{H}_{24}\text{N}_3\text{F}_3\text{S}^+$	$\text{C}_{12}\text{H}_7\text{NS}(\text{CF}_3)(\text{CH}_2)_3\text{C}_4\text{H}_8\text{N}_2\text{CH}_3$ (10H-Phenothiazine, 10-[3-(4-methyl-1-piperazinyl)propyl]-2-(trifluoromethyl)-)	117-89-5	**	7.10 ± 0.07	CTS	4079
			**	7.31 ± 0.08 (V)	PE	4667
O_2FS^+	SO_2F_2	2699-79-8		14.8 ± 0.5	EI	4921
	SO_2FCl	13637-84-8	**	13.0 ± 0.5	EI	4921
O_3FS^+	SO_3F	21549-02-0	**	12.85 ± 0.1 (V)	PE	3671
OF_2S^+	SOF_2	7783-42-8	**	12.19	PE	3705
			**	12.25	PE	3879
			**	12.58 (V)	PE	3646
			**	12.58 (V)	PE	4295
			**	12.6 (V)	PE	3694
			**	12.58 ± 0.10	EI	3818
$\text{O}_2\text{F}_2\text{S}^+$	SO_2F_2	2699-79-8	**	~ 13.0	PE	3879
			**	13.04 ± 0.01	PE	3675
			**	13.43 (V)	PE	3705
			**	13.55 (V)	PE	3694
			**	13.75 (V)	PE	4827

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$\text{O}_2\text{F}_2\text{S}^+$	SO_2F_2	2699-79-8	**	13.75 (V)	PE	5207
$\text{CH}_3\text{O}_2\text{FS}^+$	$(\text{CH}_3)\text{SO}_2(\text{F})$	558-25-8	** ** **	12.53 (V) 12.53 (V) 12.61 (V)	PE PE PE	4827 5207 3705
$\text{C}_6\text{H}_3\text{OF}_3\text{S}^+$	$\text{C}_6\text{H}_3\text{SCOCF}_3$ (Ethanone, 2,2,2-trifluoro-1-(2-thienyl)-)	651-70-7	**	9.70 ± 0.05	EI	3482
	$\text{C}_6\text{H}_3\text{SCOCF}_3$ (Ethanone, 2,2,2-trifluoro-1-(3-thienyl)-)	30933-31-4	**	9.63 ± 0.05	EI	3482
$\text{C}_{20}\text{H}_{21}\text{N}_2\text{OF}_3\text{S}^+$	$\text{C}_{12}\text{H}_7\text{NS}(\text{CF}_3)\text{COCH}_2\text{CH}_2\text{N}(\text{C}_2\text{H}_5)_2$ (10 <i>H</i> -Phenothiazine, 10-[3-(diethylamino)-1-oxopropyl]-2-(trifluoromethyl)-)	30223-48-4	**	7.89 ± 0.07	CTS	4079
$\text{C}_{22}\text{H}_{26}\text{N}_3\text{OF}_3\text{S}^+$	$\text{C}_{22}\text{H}_{26}\text{N}_3\text{OF}_3\text{S}$ (1-Piperazineethanol, 4-[3-[2-(trifluoromethyl)-10 <i>H</i> -phenothiazin-10-yl]propyl]-)	69-23-8	**	8.64 ± 0.07	CTS	4079
$\text{C}_{20}\text{H}_{19}\text{N}_2\text{O}_2\text{F}_3\text{S}^+$	$\text{C}_{12}\text{H}_7\text{NS}(\text{CF}_3)\text{COCH}_2\text{CH}_2\text{C}_4\text{H}_8\text{NO}$ (10 <i>H</i> -Phenothiazine, 10-[3-(4-morpholinyl)-1-oxopropyl]-2-(trifluoromethyl)-)	33414-29-8	**	8.54 ± 0.07	CTS	4079
$\text{C}_{22}\text{H}_{24}\text{N}_3\text{O}_2\text{F}_3\text{S}^+$	$\text{C}_{22}\text{H}_{24}\text{N}_3\text{O}_2\text{F}_3\text{S}$ (10 <i>H</i> -Phenothiazine, 10-[3-[4-(2-hydroxyethyl)-1-piperazinyl]-1-oxopropyl]-2-(trifluoromethyl)-)	33414-36-7	**	8.71 ± 0.07	CTS	4079
H_4SiS^+	SiH_3SH	14044-97-4	**	9.97 (V)	PE	3656
$\text{H}_6\text{Si}_2\text{S}^+$	$(\text{SiH}_3)_2\text{S}$	16544-95-9	** **	9.59 (V) 9.70 (V)	PE PE	3867 3656
CH_6SiS^+	$(\text{CH}_3)_2\text{S}$	16643-15-5	**	9.10 (V)	PE	3867
$\text{C}_4\text{H}_{12}\text{SiS}^+$	$(\text{CH}_3)_3\text{SiSCH}_3$	3908-55-2	**	8.69 ± 0.05 (V)	PE	4153
$\text{C}_8\text{H}_{11}\text{SiS}^+$	$\text{C}_6\text{H}_5\text{SSi}(\text{CH}_3)_3$ (Silane, trimethyl(phenylthio)-)	4551-15-9	CH_3	9.93 ± 0.1	EI	4198
$\text{C}_9\text{H}_{14}\text{SiS}^+$	$\text{C}_6\text{H}_5\text{SSi}(\text{CH}_3)_3$ (Silane, trimethyl(phenylthio)-)	4551-15-9	** **	8.67 ± 0.05 8.28 ± 0.1	PE EI	4589 4198
$\text{C}_{10}\text{H}_{16}\text{SiS}^+$	$\text{C}_6\text{H}_4(\text{SCH}_3)\text{Si}(\text{CH}_3)_3$ (Silane, trimethyl[4-(methylthio)phenyl]-)	22515-25-9	**	7.93 ± 0.05 (V)	PE	4627
	$\text{C}_6\text{H}_5\text{SCH}_2\text{Si}(\text{CH}_3)_3$ (Silane, trimethyl [(phenylthio)methyl]-)	17873-08-4	**	7.81 ± 0.05 (V)	PE	4627
$\text{C}_{11}\text{H}_{18}\text{SiS}^+$	$\text{C}_{11}\text{H}_{18}\text{SiS}$ (Silane, trimethyl[[4-(methylthio)phenyl]methyl]-)	59163-55-2	**	7.72 ± 0.05 (V)	PE	4627

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{13}H_{11}SiS^+$	$C_{12}H_8SiS(CH_3)_2$ (10H-Phenothiasilin, 10,10-dimethyl-)	61431-08-1	CH_3	8.5 ± 0.1	EI	4664
$C_{11}H_{11}SiS^+$	$C_{12}H_8SiS(CH_3)_2$ (10H-Phenothiasilin, 10,10-dimethyl-)	61431-08-1	**	7.8 ± 0.1	EI	4664
$C_6H_{18}Si_2S^+$	$((CH_3)_3Si)_2S$	3385-94-2	** **	8.74 ± 0.05 (V) 8.70 ± 0.1	PE EI	4153 4198
CH_3NSiS^+	SiH_3NCS	14311-54-7	**	9.54 ± 0.02 (V)	PE	3670
$C_1H_9NSiS^+$	$(CH_3)_3SiNCS$	2290-65-5	**	9.3 ± 0.1 (V)	PE	3670
$B_2C_5H_{16}N_2SiS^+$	$N_3B_2SH(CH_3)_2Si(CH_3)_3$ (1,3,4,2,5-Thiadiazadiborolidine, 2,5-dimethyl-3-(trimethylsilyl)-)	57877-86-8	**	8.25 (V)	PE	4526
H_3NOSiS^+	SiH_3NSO	57251-86-2	**	10.55 (V)	PE	4409
PS^+	SP	12281-36-6	**	9.0	EI	4001
P_1S^+	P_4S		**	10.6 ± 0.5	EI	3615
$P_4S_2^+$	P_4S_2	12165-70-7	**	10.6 ± 0.5	EI	3615
$P_4S_3^+$	P_4S_3	1314-85-8	** **	9.01 (V) 9.7 ± 0.5	PE EI	4704 3615
$P_4S_4^+$	P_4S_4	XXXXXX-XX-X	**	10.1 ± 0.5	EI	3615
$P_4S_5^+$	P_4S_5	12137-70-1	**	10.4 ± 0.5	EI	3615
$P_4S_6^+$	P_4S_6	XXXXXX-XX-X	**	10.0 ± 0.5	EI	3615
$P_4S_7^+$	P_4S_7	12037-82-0	**	10.1 ± 0.5	EI	3615
$P_4S_8^+$	P_4S_8	37295-14-0	**	9.8 ± 0.5	EI	3615
$P_4S_9^+$	P_4S_9	25070-46-6	**	9.8 ± 0.5	EI	3615
$P_4S_{10}^+$	P_4S_{10}	12066-62-5	**	9.6 ± 0.5	EI	3615
CH_2PS^+	$(CH_3O)_2P(CH_3S)$	2953-29-9	$H + HCHO + HS$	14.05 ± 0.30	EI	3989

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_2H_7PS^+$	$(CH_3)_2P(S)H$	6591-05-5	**	8.78 (V)	PE	5523
$C_3H_9PS^+$	$(CH_3)_3PS$	2404-55-9	**	8.48 ± 0.035 (V)	PE	5529
			**	8.48 (V)	PE	5442
$C_6H_{15}PS_2^+$	$C_2H_5S_2P(C_2H_5)_2$	5745-32-4	**	8.68 (V)	PE	5569
$C_6H_{18}N_3PS^+$	$PS(N(CH_3)_2)_3$	3732-82-9	**	7.66 ± 0.003	PE	4086
			**	7.66 ± 0.02	PE	4279
			**	8.05 (V)	PE	5627
$C_2H_6OPS^+$	$(CH_3O)_2P(CH_3S)S$	2953-29-9	HCHO + HS	11.70 ± 0.20	EI	3989
$C_7H_{17}OPS^+$	$(C_3H_7O)(C_2H_5)_2PS$	54867-58-2	**	8.08 ± 0.04	PE	4279
			**	8.53 (V)	PE	5627
$C_2H_6O_2PS^+$	$(CH_3O)_2P(CH_3S)O$	152-20-5	CH_3O	11.82 ± 0.20	EI	3989
	$(CH_3O)_2P(CH_3S)S$	2953-29-9	CH_3S	10.10 ± 0.10	EI	3989
	$(CH_3S)_2P(CH_3O)O$	22608-53-3	CH_3S	10.50 ± 0.10	EI	3989
$C_2H_7O_2PS^+$	$(CH_3O)_2P(CH_3S)O$	152-20-5	HCHO	10.51 ± 0.10	EI	3989
	$(CH_3O)_2P(CH_3S)S$	2953-29-9	HCHS	10.35 ± 0.10	EI	3989
	$(CH_3S)_2P(CH_3O)O$	22608-53-3	HCHS	10.10 ± 0.10	EI	3989
$C_2H_6O_3PS^+$	$(CH_3O)_2P(CH_3S)O$	152-20-5	CH_3	10.03 ± 0.10	EI	3989
$C_3H_9O_3PS^+$	$(CH_3O)_3PS$	152-18-1	**	9.16 (V)	PE	4705
	$(CH_3O)_2P(CH_3S)O$	152-20-5	**	9.55 ± 0.10	EI	3989
$C_6H_{15}O_3PS^+$	$(C_2H_5O)_3PS$	126-68-1	**	8.49 ± 0.02	PE	4279
			**	8.96 (V)	PE	5514
	$SP(OC_2H_5)_3$	1186-09-0	**	8.96 (V)	PE	5627
$C_{12}H_{27}O_3PS^+$	$SP(OC_4H_9)_3$	12408-16-1	**	8.02	PE	5627
$C_2H_6OPS_2^+$	$(CH_3O)_2P(CH_3S)S$	2953-29-9	CH_3O	10.20 ± 0.30	EI	3989
	$(CH_3S)_2P(CH_3O)O$	22608-53-3	CH_3O	10.15 ± 0.10	EI	3989
$C_2H_7OPS_2^+$	$(CH_3O)_2P(CH_3S)S$	2953-29-9	HCHO	10.00 ± 0.10	EI	3989
	$(CH_3S)_2P(CH_3O)O$	22608-53-3	HCHO	9.90 ± 0.20	EI	3989
$C_2H_6O_2PS_2^+$	$(CH_3O)_2P(CH_3S)S$	2953-29-9	CH_3	9.65 ± 0.20	EI	3989
	$(CH_3S)_2P(CH_3O)O$	22608-53-3	CH_3	9.47 ± 0.10	EI	3989
$C_3H_9O_2PS_2^+$	$(CH_3O)_2P(CH_3S)S$	2953-29-9	**	9.0 ± 0.10	EI	3989
	$(CH_3S)_2P(CH_3O)O$	22608-53-3	**	9.20 ± 0.10	EI	3989

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_4H_{11}O_2PS_2^+$	$HS_2P(OC_2H_5)_2$	298-06-6	**	9.1 (V)	PE	4636
$C_8H_{19}O_2PS_3^+$	$(C_2H_5O)_2P(=S)SCH_2CH_2SC_2H_5$	XXXXX-XX-X	**	9.0 (V)	PE	5190
F_3PS^+	F_3PS	2404-52-6	**	11.05 ± 0.035 (V)	PE	5529
CNF_2PS^+	PF_2NCS	461-60-9	**	10.2 ± 0.1 (V)	PE	3662
Cl^+	$Cl(P_{3/2}^o)$	22537-15-1	**	12.97 ± 0.02	PE	5087
	$(^3P_2)$		**	12.97	PE	5214
	$(^1P_1)$		**	13.06 ± 0.02	PE	5087
	$(^3P_1)$		**	13.06	PE	5214
	$(^1P_0)$		**	13.1	PE	5214
	$(^1D_2)$		**	14.41 ± 0.02	PE	5087
	$(^1D_2)$		**	14.412	S	5209
	$(^1D_2)$		**	14.42	PE	5214
	$(^1S_0)$		**	16.42	PE	5214
	CH_2Cl_2	75-09-2	CH_2Cl	17.4 ± 0.1	EI	3442
			CH_2Cl	17.4	EI	3490
	$COCl_2$	75-44-5	$ClCO$	16.5 ± 0.2	PI	5041
	$(CH_3)_2CClNO$	2421-26-3		22.70	EI	4809
	CF_3Cl	75-72-9	CF_3	19.66 ± 0.1	PI	5399
	CF_2Cl_2	75-71-8	$CFCl_2$	16.40 ± 0.2	PI	5399
	$CFCl_3$	75-69-4	$F + CCl_2$	13.7 ± 0.5	PI	5399
			$F + CCl_2$	15.20 ± 0.1	PI	5399
			$Cl + CFCl$	15.6 ± 0.1	PI	5399
	Ag_3Cl_3	12444-97-2		~ 15.5	EI	3605
Cl^{+2}	Cl^+	14835-24-6	**	23.8137 ± 0.0002	S	3756
			**	23.8138 ± 0.0002	S	4175
Cl_2^+	Cl_2	7782-50-5	**	11.49	PE	3507
			**	14.43 (V)	PE	3507
			**	16.10 (V)	PE	3507
	CF_2Cl_2	75-71-8	CF_2	15.40 ± 0.1	PI	5399
HCl^+	HCl	7647-01-0	**	12.72 ± 0.03	PI	5307
	$(CH_3)_2CClNO$	2421-26-3		13.35	EI	4809
H_2Cl^+	$(HCl)_2$	XXXXX-XX-X	Cl	12.32 ± 0.03	PI	5307
$H_2Cl_2^+$	$(HCl)_2$	XXXXX-XX-X	**	11.91 ± 0.05	PI	5307
$LiCl^+$	$LiCl$	7447-41-8	**	9.57	PI	5509
			**	10.01 ± 0.02 (V)	PE	4950
$Li_2Cl_2^+$	$(LiCl)_2$	12345-57-2	**	10.20	PI	5509
			**	~ 10.70 (V)	PE	4950

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
Li_3Cl_3^+	$(\text{LiCl})_3$	59217-69-5	**	10.17	PI	5509
BeCl_2^+	BeCl_2	7787-47-5	**	12.5 ± 1.0	EI	4113
BCl^+	BCl	20583-55-5	**	12 ± 1	EI	3465
BCl_2^+	BCl_2	13842-52-9	**	12 ± 1.0	EI	3465
BCl_3^+	BCl_3	10294-34-5	**	11.62 (V)	PE	3704
B_2Cl_4^+	B_2Cl_4	13701-67-2	**	$\leq 10.42 \pm 0.02$	PE	3709
$\text{H}_8\text{B}_5\text{Cl}^+$	$\text{B}_5\text{H}_8\text{Cl}$ (Pentaborane(9), 1-chloro-)	19469-13-7	**	10.03 (V)	PE	4519
	$\text{B}_5\text{H}_8\text{Cl}$ (Pentaborane(9), 2-chloro-)	19469-14-8	**	10.24 (V)	PE	4519
CCl^+	$\text{C}_2\text{F}_3\text{Cl}$	79-38-9	CF_3	16.9 ± 0.1	EI	4070
	CF_2Cl_2	75-71-8	$\text{FCl} + \text{F}^-$	14.80 ± 0.2	PI	5399
	$\text{CFCl} = \text{CFCl}$	598-88-9	CF_2Cl	16.4 ± 0.2	EI	4070
	CFCl_3	75-69-4	$2\text{Cl} + \text{F}$	20.00 ± 0.2	PI	5399
				20.5	PI	5196
CCl_2^+	$\text{CFCl} = \text{CFCl}$	598-88-9	CF_2	13.8 ± 0.1	EI	4070
	CFCl_3	75-69-4	FCl	17.0	PI	5196
			$\text{Cl} + \text{F}$	17.12 ± 0.04	PI	4757
C_4Cl_2^+	$\text{CCl} = \text{CC} = \text{CCl}$	51104-87-1	**	9.34 ± 0.02	PE	4162
CCl_3^+	CCl_1	3170-80-7	**	8.28	EI	3732
	CCl_4	56-23-5	Cl	11.28 ± 0.03	PI	4308
			Cl	11.37	EI	3732
	$(\text{CCl}_3)_2\text{CO}$	116-16-5		11.75	EI	3550
	CFCl_3	75-69-4	F	13.25 ± 0.04	PI	4757
			F	13.50	PI	5196
C_6Cl_4^+	C_6Cl_4 (1,3-Cyclohexadien-5-yne, 1,2,3,4-tetrachloro-)	13280-72-3	**	10.66 ± 0.2	EI	3583
	$\text{C}_8\text{O}_3\text{Cl}_4$ (1,3-Isobenzofurandione, 4,5,6,7-tetrachloro-)	117-08-8		14.31 ± 0.2	EI	3583
	$\text{C}_6\text{Cl}_5\text{I}$ (Benzene, pentachloroiodo-)	16478-18-5		14.51 ± 0.2	EI	3583
	$\text{C}_6\text{Cl}_4\text{I}_2$ (Tetrachloro-1,2-diiodobenzene)	XXXXXX-XX-X		12.85 ± 0.2	EI	3583
C_2Cl_6^+	C_2Cl_6	67-72-1	**	11.22 (V)	PE	4547
C_6Cl_6^+	C_6Cl_6 (Benzene, hexachloro-)	118-74-1	**	9.20 (V)	PE	3873

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_6Cl_6^+$	C_6Cl_6	118-74-1	**	9.31 ± 0.05 (V)	PE	5558
$C_{10}Cl_8^+$	$(C_5Cl_4)_2$ (1,3-Cyclopentadiene, 1,2,3,4-tetrachloro-5-(2,3,4,5-tetrachloro-2,4-cyclopentadien-1-ylidene)-)	6298-65-3	**	8.47 (V)	PE	4813
$C_6H_5Cl^+$	C_6H_5Cl (Benzene, chloro-)	108-90-7	**	9.08 (V)	PE	5125
CH_2Cl^+	CH_2Cl	6806-86-6	**	8.80	EI	3732
	CH_3Cl	74-87-3	H	12.96	EI	3732
	CH_2Cl_2	75-09-2	Cl	12.14 ± 0.02	PI	4308
			Cl	12.15	EI	3732
CH_3Cl^+	CH_3Cl	74-87-3	**	11.221	S	5245
			**	11.28 ± 0.01	PI	4308
			**	11.29 (V)	PE	5249
			**	11.27	EI	3732
C_2HCl^+	$CH \equiv CCl$	593-63-5	**	11.044 ± 0.004	S	3876
$C_2H_2Cl^+$	$CH_2 = CFCI$	2317-91-1	F	14.8 ± 0.1	EI	4070
$C_2H_3Cl^+$	C_2H_3Cl	75-01-4	**	9.99 ± 0.02	PI	3930
			**	11.65	PI	3930
			**	10.01	PE	3863
			**	10.15 (V)	PE	4303
	CH_2ClCH_2Cl	107-06-2		11.1	PI	5501
$C_2H_4Cl^+$	CH_3CHCl_2	75-34-3		11.20	PI	5501
	CH_2ClCH_2Cl	107-06-2		11.47	PI	5501
	CH_2BrCH_2Cl	107-04-0		10.72	PI	5501
	$CH_3CHClBr$	593-96-4		10.52	PI	5501
$C_2H_5Cl^+$	C_2H_5Cl	75-00-3	**	11.01 (V)	PE	4076
			**	11.01 (V)	PE	5088
			**	11.01 (V)	PE	5249
			**	11.06 ± 0.02 (V)	PE	4547
$C_3H_3Cl^+$	$CH_2ClC \equiv CH$	624-65-7	**	10.76 (V)	PE	4684
			**	10.76 (V)	PE	4847
				10.68	EI	5282
	$CH_2 = C = CHCl$	3223-70-9	**	9.57 (V)	PE	4748
	$CH_3C \equiv CCl$	7747-84-4	**	9.83 ± 0.02	PE	4765
				9.82	EI	5282
$C_3H_5Cl^+$	$CH_2 = CHCH_2Cl$	107-05-1	**	10.05	PE	3863
			**	10.20 (V)	PE	4260
			**	10.34 (V)	PE	4091

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_3H_6Cl^+$	$(CH_3)_2CClNO$	2421-26-3		9.70	EI	4809
$C_3H_7Cl^+$	<i>n</i> - C_3H_7Cl	540-54-5	**	10.82	PI	5069
			**	10.88 (V)	PE	4076
	<i>iso</i> - C_3H_7Cl	75-29-6	**	10.78	PI	5069
			**	$11.0 \pm <0.1$	EI	3735
C_4HCl^+	$CH \equiv CC \equiv CCl$	6089-44-7	**	9.72 ± 0.02	PE	4162
$C_4H_5Cl^+$	<i>n</i> - C_4H_5Cl	109-69-3	**	10.84 (V)	PE	4076
	<i>tert</i> - C_4H_5Cl	507-20-0	**	10.76 (V)	PE	4566
$C_5H_3Cl^+$	$CH_3C \equiv CC \equiv CCl$	40331-44-0	**	9.15 ± 0.02	PE	4162
$C_6H_4Cl^+$	$C_6H_5COC_6H_4Cl$ (Methanone, (2-chlorophenyl)phenyl-)	5162-03-8		15.6 ± 0.3	EI	4358
	$C_6H_5COC_6H_4Cl$ (Methanone, (3-chlorophenyl)phenyl-)	1016-78-0		15.7 ± 0.3	EI	4358
	$C_6H_5COC_6H_4Cl$ (Methanone, (4-chlorophenyl)phenyl-)	134-85-0		15.7 ± 0.3	EI	4358
	$C_6H_4ClNO_2$ (Benzene, 1-chloro-3-nitro-)	121-73-3	NO_2	12.00 ± 0.1	EI	3447
	$C_6H_4ClNO_2$ (Benzene, 1-chloro-4-nitro-)	100-00-5	NO_2	12.30 ± 0.1	EI	3447
$C_6H_5Cl^+$	C_6H_5Cl (Benzene, chloro-)	108-90-7	**	9.067 (V)	PE	5257
			**	9.07 (V)	PE	5258
			**	9.09	PE	4621
			**	9.09 (V)	PE	3873
			**	9.10 ± 0.02	PE	5138
			**	9.10 ± 0.02	PE	5305
			**	8.99	EI	3845
			**	9.12 ± 0.1	EI	3788
			**	9.55	EI	4834
	$C_6H_4ClOCH_3$ (Benzene, 1-chloro-3-methoxy-)	2845-89-8	CH_2O	11.68 ± 0.1	EI	3446
	$C_6H_4ClOCH_3$ (Benzene, 1-chloro-4-methoxy-)	623-12-1	$HCHO$	11.42	EI	3845
			CH_2O	11.56 ± 0.1	EI	3446
	$(C_6H_5Cl)(CO)_3Cr$ (Chromium, tricarbonyl(η^6 -chlorobenzene)-)	12082-03-0		9.15 ± 0.1	EI	3788
$C_6H_{11}Cl^+$	$C_6H_{11}Cl$ (Cyclohexane, chloro-)	542-18-7	**	10.10 ± 0.01	PI	4078
			**	10.67 (V)	PE	4078
$C_7H_6Cl^+$	$C_6H_5ClCH_2CH_2OCOCH_3$ (Phenethyl alcohol, <i>m</i> -chloro-, acetate)	33709-41-0		12.90	EI	3590
$C_7H_7Cl^+$	$C_6H_5CH_2Cl$ (Benzene, chloromethyl-)	25168-05-2	**	9.14 ± 0.01	PI	5515

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₇H₇Cl⁺	C ₆ H ₅ CH ₂ Cl	25168-05-2	**	9.14±0.01	PI	5557
	C ₆ H ₅ CH ₂ Cl (Benzene, (chloromethyl)-)	100-44-7	**	9.30 (V)	PE	3992
	C ₆ H ₄ ClCH ₃ (Benzene, 1-chloro-2-methyl-)	95-49-8	**	8.72±0.1	EI	3777
	C ₆ H ₄ ClCH ₃ (Benzene, 1-chloro-3-methyl-)	108-41-8	**	8.67±0.1	EI	3777
	C ₆ H ₄ ClCH ₃ (Benzene, 1-chloro-4-methyl-)	106-43-4	**	8.78±0.1	EI	3777
C₈H₅Cl⁺	C ₆ H ₅ C≡CCl (Benzene, (chloroethynyl)-)	1483-82-5	**	8.70 (V)	PE	4334
	C ₆ H ₄ (Cl)C≡CH (Benzene, 1-chloro-4-ethynyl-)	873-73-4	**	8.75 (V)	PE	4334
C₈H₇Cl⁺	C ₆ H ₄ ClCH ₂ CH ₂ OCOCH ₃ (Phenethyl alcohol, <i>m</i> -chloro-, acetate)	33709-41-0		8.90	EI	3590
C₈H₉Cl⁺	CH ₃ C ₆ H ₄ CH ₂ Cl (Benzene, 1-(chloromethyl)-3-methyl-)	620-19-9	**	8.82±0.03	PI	5557
	CH ₃ C ₆ H ₄ CH ₂ Cl (Benzene, 1-(chloromethyl)-4-methyl-)	104-82-5	**	8.79±0.03	PI	5557
C₉H₉Cl⁺	C ₆ H ₄ (Cl)C ₃ H ₅ (Benzene, 1-chloro-4-cyclopropyl-)	1798-84-1	**	8.64 (V)	PE	4815
C₉H₁₁Cl⁺	(CH ₃) ₂ C ₆ H ₃ CH ₂ Cl (Benzene, 1-(chloromethyl)-3,5-dimethyl-)	2745-54-2	**	8.63±0.03	PI	5557
C₁₀H₁₁Cl⁺	C ₆ H ₄ (Cl)C ₃ H ₄ (CH ₃) (Benzene, 1-chloro-4-(1-methylcyclopropyl)-)	63340-05-6	**	8.67 (V)	PE	4815
C₁₀H₁₃Cl⁺	C ₆ H ₄ Cl(tert-C ₄ H ₉) (Benzene, 1-chloro-4-(1,1-dimethylethyl)-)	3972-56-3	**	8.82 (V)	PE	4438
C₁₀H₁₅Cl⁺	C ₁₀ H ₁₅ Cl (Tricyclo[3.3.1.1 ^{3,7}]decane, 1-chloro-)	935-56-8	**	9.30	PE	3886
C₁₁H₁₃Cl⁺	C ₆ H ₄ (Cl)C ₃ H ₄ (C ₂ H ₅) (Benzene, 1-chloro-4-(1-ethylcyclopropyl)-)	63340-06-7	**	8.64 (V)	PE	4815
C₁₁H₁₅Cl⁺	(tert-C ₄ H ₉)C ₆ H ₄ CH ₂ Cl (Benzene, 1-(chloromethyl)-3-dimethylethyl-)	38580-79-9	**	8.71±0.03	PI	5557
	(tert-C ₄ H ₉)C ₆ H ₄ CH ₂ Cl (Benzene, 1-(chloromethyl)-4-dimethylethyl-)	19692-45-6	**	8.60±0.03	PI	5557
C₁₂H₉Cl⁺	C ₆ H ₅ C ₆ H ₄ Cl (1,1'-Biphenyl, 2-chloro-)	2051-60-7	**	8.20±0.02	PE	3702
	C ₆ H ₅ C ₆ H ₄ Cl (1,1'-Biphenyl, 4-chloro-)	2051-62-9	**	8.10±0.02	PE	3702

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{12}H_{15}Cl^+$	$C_{12}H_{15}Cl$ (Benzene, 1-chloro-4-[1-(1-methylethyl)cyclopropyl]-)	63340-07-8	**	8.64 (V)	PE	4815
$C_{13}H_{17}Cl^+$	$C_{13}H_{17}Cl$ (Benzene, 1-chloro-4-[1-(1,1-dimethylethyl)cyclopropyl]-)	63340-08-9	**	8.64 (V)	PE	4815
$C_{14}H_9Cl^+$	$C_{14}H_9Cl$ (Anthracene, 9-chloro-)	716-53-0	**	7.45 ± 0.03 (V)	PE	4887
$C_{15}H_{23}Cl^+$	$(tert-C_3H_7)_2C_6H_3CH_2Cl$ (Benzene, 1-(chloromethyl)-3,5-bis(1,1-dimethylethyl)-)	51625-14-0	**	8.29 ± 0.03	PI	5557
$C_{21}H_{15}Cl^+$	$C_{21}H_{15}Cl$ (Cyclopropenylum, triphenyl-,chloride)	58090-78-1	**	7.75 ± 0.05	EI	4628
$CHCl_2^+$	$CHCl_2$	3474-12-2	**	8.45	EI	3732
	$CHCl_3$	67-66-3	Cl	11.49 ± 0.02	PI	4308
			Cl	11.52	EI	3732
	$CHCl_2CH_2Cl$	79-00-5	CH_2Cl	11.80	EI	3732
$CH_2Cl_2^+$	CH_2Cl_2	75-09-2	**	11.32 ± 0.01	PI	4308
			**	11.28	EI	3732
$C_2H_2Cl_2^+$	$CH_2=CCl_2$	75-35-4	**	10.00 (V)	PE	4303
			**	9.99 ± 0.02 (V)	PE	4880
	<i>cis</i> -CHCl=CHCl	156-59-2	**	9.80 (V)	PE	4303
	<i>trans</i> -CHCl=CHCl	156-60-5	**	9.72 (V)	PE	3648
			**	9.80 (V)	PE	4303
			**	11.92 (V)	PE	4022
$C_2H_4Cl_2^+$	CH_3CHCl_2	75-34-3	**	11.06	PI	5501
			**	11.02	PE	5501
			**	11.23 ± 0.02 (V)	PE	4547
	CH_2ClCH_2Cl	107-06-2	**	11.05	PI	5501
			**	11.04	PE	5501
			**	11.13 ± 0.10 (V)	PE	4732
			**	11.22 ± 0.02 (V)	PE	4367
			**	11.39 ± 0.03 (V)	PE	4144
			**	11.40 ± 0.10 (V)	PE	4732
$C_3H_6Cl_2^+$	$C_3H_6Cl_2$ (Cyclopentene, 4,4-dichloro-)	XXXXX-XX-X	**	9.78 (V)	PE	4517
$C_6H_2Cl_2^+$	$C_6H_2Cl_2$ (1,3-Cyclohexadien-5-yne, 1,2-dichloro-)	24634-92-2	**	9.66 ± 0.2	EI	3583
	$C_6H_2Cl_2$ (1,3-Cyclohexadien-5-yne, 1,3-dichloro-)	24634-94-4	**	9.97 ± 0.2	EI	3583
	$C_6H_2Cl_2$ (1,3-Cyclohexadien-5-yne, 1,4-dichloro-)	XXXXX-XX-X	**	9.11 ± 0.2	EI	3583
	$C_6H_2Cl_2$ (1,3-Cyclohexadien-5-yne, 2,3-dichloro-)	24634-93-3	**	9.58 ± 0.2	EI	3583

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_6H_2Cl_2^+$	$C_6H_2O_3Cl_2$ (1,3-Isobenzofurandione, 4,7-dichloro-)	4466-59-5		13.60 ± 0.2	EI	3583
	$C_6H_2O_3Cl_2$ (1,3-Isobenzofurandione, 5,6-dichloro-)	942-06-3		14.06 ± 0.2	EI	3583
	$C_6H_2Cl_2I_2$ (3,4-Dichloro-1,2-diiodobenzene)	XXXXX-XX-X		14.11 ± 0.2	EI	3583
	$C_6H_2Cl_2I_2$ (3,5-Dichloro-1,2-diiodobenzene)	XXXXX-XX-X		14.43 ± 0.2	EI	3583
	$C_6H_2Cl_2I_2$ (4,5-Dichloro-1,2-diiodobenzene)	XXXXX-XX-X		14.11 ± 0.2	EI	3583
$C_6H_4Cl_2^+$	$C_6H_4Cl_2$ (Benzene, 1,2-dichloro-)	95-50-1	**	9.06 ± 0.02	PE	5138
			**	9.08 (V)	PE	3873
	$C_6H_4Cl_2$ (Benzene, 1,3-dichloro-)	541-73-1	**	9.12 ± 0.02	PE	5138
			**	9.15 (V)	PE	3873
	$C_6H_4Cl_2$ (Benzene, 1,4-dichloro-)	106-46-7	**	8.98 ± 0.02	PE	5138
			**	8.988 (V)	PE	5257
$C_7H_6Cl_2^+$	$C_6H_3Cl_2CH_3$ (Benzene, 1,3-dichloro-2-methyl-)	118-69-4	**	8.73 (V)	PE	5461
	$C_6H_3Cl_2CH_3$ (Benzene, 1,3-dichloro-5-methyl-)	25186-47-4	**	9.99 ± 0.02	PE	5521
			**	9.99 (V)	PE	5461
	$C_6H_3Cl_2CH_3$ (Benzene, 1,4-dichloro-2-methyl-)	19398-61-9	**	8.75 ± 0.02	PE	5521
$C_8H_6Cl_2^+$	$C_6H_3(Cl)CH=CH_2$ (Benzene, 1,3-dichloro-2-ethenyl-)	28469-92-3	**	8.70 ± 0.02	PE	3854
$C_8H_8Cl_2^+$	$C_6H_5CH_2CHCl_2$ (Benzene, (2,2-dichloroethyl)-)	4412-39-9	**	9.27 (V)	PE	4927
$C_9H_8Cl_2^+$	$C_6H_5C_3H_3Cl_2$ (Benzene, (2,2-dichlorocyclopropyl)-)	2415-80-7	**	8.97 (V)	PE	4927
$C_{10}H_6Cl_2^+$	$C_{10}H_6Cl_2$ (Azulene, 1,3-dichloro-)	14658-94-7	**	7.45 (V)	PE	5397
$C_{14}H_8Cl_2^+$	$C_{14}H_8Cl_2$ (Anthracene, 9,10-dichloro-)	605-48-1	**	7.58	PE	4364
$C_{15}H_{10}Cl_2^+$	$C_{15}H_{10}Cl_2$ (1H-Cyclopropa[<i>l</i>]phenanthrene, 1,1-dichloro-1a,9b-dihydro-)	37608-29-0	**	8.06 (V)	PE	4927
$CHCl_3^+$	$CHCl_3$	67-66-3	**	11.37 ± 0.02	PI	4308
			**	11.48 (V)	PE	4146
			**	11.41	EI	3732

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$\text{C}_2\text{H}_3\text{Cl}_3^+$	CH_3CCl_3	71-55-6	**	11.25 (V)	PE	4547
$\text{C}_6\text{H}_3\text{Cl}_3^+$	$\text{C}_6\text{H}_3\text{Cl}_3$ (Benzene, 1,2,3-trichloro-)	87-61-6	**	9.22 (V)	PE	3873
	$\text{C}_6\text{H}_3\text{Cl}_3$ (Benzene, 1,3,5-trichloro-)	108-70-3	**	9.34 ± 0.02	PE	5138
			**	9.36 (V)	PE	3873
$\text{C}_2\text{H}_2\text{Cl}_4^+$	$\text{CH}_2\text{ClCCl}_3$	630-20-6	**	11.45 (V)	PE	4547
$\text{C}_6\text{H}_2\text{Cl}_4^+$	$\text{C}_6\text{H}_2\text{Cl}_4$ (Benzene, 1,2,3,4-tetrachloro-)	634-66-2	**	9.11 (V)	PE	3873
	$\text{C}_6\text{H}_2\text{Cl}_4$ (Benzene, 1,2,3,5-tetrachloro-)	634-90-2	**	9.16 (V)	PE	3873
	$\text{C}_6\text{H}_2\text{Cl}_4$ (Benzene, 1,2,4,5-tetrachloro-)	95-94-3	**	9.06 (V)	PE	3873
			**	9.20 ± 0.05 (V)	PE	5558
C_2HCl_5^+	$\text{CHCl}_2\text{CCl}_3$	76-01-7	**	11.28 (V)	PE	4547
C_6HCl_5^+	C_6HCl_5 (Benzene, pentachloro-)	608-93-5	**	9.11 (V)	PE	3873
$\text{BeC}_3\text{H}_5\text{Cl}^+$	$(\text{C}_3\text{H}_5)\text{BeCl}$ (Beryllium, chloro(η^5 -2,4-cyclopentadien-1-yl)-)	36346-97-1	**	9.60 (V)	PE	5384
$\text{BC}_2\text{H}_6\text{Cl}^+$	$(\text{CH}_3)_2\text{BCl}$ (Borane, chlorodimethyl)	1803-36-7	**	10.78 (V)	PE	5485
$\text{B}_4\text{C}_2\text{H}_5\text{Cl}^+$	$\text{C}_2\text{B}_4\text{H}_5\text{Cl}$ (1,6-Dicarbaheptaborane(6),2-chloro-)	33616-59-0	**	9.53 (V)	PE	5553
$\text{BCH}_3\text{Cl}_2^+$	CH_3BCl_2 (Borane, dichloromethyl)	7318-78-7	**	11.51	PE	5485
$\text{B}_4\text{C}_2\text{H}_4\text{Cl}_2^+$	$\text{C}_2\text{B}_4\text{H}_4\text{Cl}_2$ (1,6-Dicarbaheptaborane(6),2,4-dichloro-)	XXXXXX-XX-X	**	9.38 (V)	PE	5553
$\text{BC}_6\text{H}_3\text{Cl}_2^+$	$\text{C}_6\text{H}_3\text{BCl}_2$ (Borane, dichlorophenyl-)	873-51-8	**	9.52 (V)	PE	4956
N_3Cl^+	ClN_3	13973-88-1	**	10.20 ± 0.01	PE	5001
NCl_3^+	NCl_3	10025-85-1	**	10.12 ± 0.1	PE	4737
H_2NCl^+	NH_2Cl	10599-90-3	**	9.85 ± 0.02	PE	4763
			**	10.60 (V)	PE	5544

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
HNCI₂⁺	NHCl ₂	3400-09-7	**	9.98±0.05	PE	4737
			**	10.52 (V)	PE	5544
H₃B₃N₃Cl₃⁺	B ₃ H ₃ N ₃ Cl ₃ (Borazine,2,4,6-trichloro-)	933-18-6	**	10.55 (V)	PE	3673
			**	10.55 (V)	PE	3943
C₃NCl⁺	CCl≡CCN	2003-31-8	**	10.95±0.02	PE	4765
C₅NCl₅⁺	C ₅ N(Cl) ₅ (Pyridine, pentachloro-)	2176-62-7	**	9.44 (V)	PE	4275
CH₃NCl⁺	CH ₃ NHCl	6154-14-9	**	9.19±0.02	PE	4737
			**	9.70±0.10 (V)	PE	4741
C₂H₂NCl⁺	CH ₂ ClCN	107-14-2	**	11.95±0.01	PE	4679
			**	11.98 (V)	PE	4684
C₂H₆NCl⁺	(CH ₃) ₂ NCl	1585-74-6	**	8.67±0.02	PE	4737
			**	9.25 (V)	PE	5304
C₃H₂NCl⁺	CH ₂ =C(Cl)CN	920-37-6	**	10.58±0.05 (V)	PE	4859
C₅H₄NCl⁺	ClC ₅ H ₄ N (Pyridine,2-chloro-)	109-09-1	**	9.54 (V)	PE	5258
			**	9.9±0.1	EI	4302
	ClC ₅ H ₄ N (Pyridine,3-chloro-)	626-60-8	**	9.58 (V)	PE	5258
			**	9.75±0.1	EI	4302
	ClC ₅ H ₄ N (Pyridine,4-chloro-)	626-61-9	**	10.2 (V)	PI	5566
			**	9.86 (V)	PE	5258
			**	10.0±0.1	EI	4302
C₅H₁₀NCl⁺	C ₅ H ₁₀ NCl (Piperidine,1-chloro-)	2156-71-0	**	9.00±0.10 (V)	PE	5308
C₆H₆NCl⁺	C ₆ H ₄ CINH ₂ (Benzeneamine, 2-chloro-)	95-51-2	**	8.50	EI	4834
	C ₆ H ₄ CINHCOCH ₃ (Acetamide, N-(2-chlorophenyl)-)	533-17-5		11.05	EI	4834
			CH ₂ =C=O	10.76±0.03	EI	3483
	C ₆ H ₄ CINHCOCH ₃ (Acetamide, N-(4-chlorophenyl)-)	539-03-7	CH ₂ =C=O	10.11±0.03	EI	3483
	C ₆ H ₄ CINHCOCH ₂ H ₅ (Propanamide, N-(2-chlorophenyl)-)	2760-32-9		10.75	EI	4834
	C ₆ H ₄ CINHCOCH ₂ CH ₂ CH ₃ (Butanamide, N-(2-chlorophenyl)-)	33694-15-4		10.70	EI	4834
	C ₆ H ₄ CINHCOCH(CH ₃) ₃ (Propanamide, N-(2-chlorophenyl)-2,2-dimethyl-)	62662-74-2		10.70	EI	4834
	C ₆ H ₄ CINHCOCH ₂ C(CH ₃) ₃ (Butanamide, N-(2-chlorophenyl)-3,3-dimethyl-)	XXXXXX-XX-X		10.45	EI	4834

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₆H₆NCl⁺	C ₆ H ₄ ClNHCONH ₂ (Urea, (2-chlorophenyl)-)	114-38-5		9.15	EI	4834
	C ₆ H ₄ ClNHCONHCH ₃ (Urea, N-(2-chlorophenyl)-N'-methyl-)	15500-96-6		10.20	EI	4834
	C ₆ H ₄ ClNHCONHC ₂ H ₅ (Urea, N-(2-chlorophenyl)-N'-ethyl-)	62635-53-4		10.05	EI	4834
	C ₆ H ₄ ClNHCONHCH(CH ₃) ₂ (Urea, N-(2-chlorophenyl)-N'-(1-methylethyl)-)	62635-47-6		9.80	EI	4834
	C ₆ H ₄ ClNHCONHC(CH ₃) ₃ (Urea, N-(2-chlorophenyl)-N'-(1,1-dimethylethyl)-)	62635-48-7		9.70	EI	4834
	C ₆ H ₄ ClNHCSCH ₃ (Ethanethioamide, N-(2-chlorophenyl)-)	39184-83-3		11.00	EI	4834
	C ₆ H ₄ ClNHCSCH ₂ C(CH ₃) ₃ (Butanethioamide, N-(2-chlorophenyl)-3,3-dimethyl-)	62635-54-5		11.00	EI	4834
C₇H₁₂NCl⁺	C ₇ H ₁₂ NCl (1-Azabicyclo[2.2.2]octane, 4-chloro-)	5960-95-2	**	8.55±0.015 (V)	PE	4286
C₈H₁₀NCl⁺	C ₆ H ₃ ClN(CH ₃) ₂ (Benzenamine, 4-chloro-N,N-dimethyl-)	698-69-1	**	7.2±0.1	PE	4401
C₈H₁₄NCl⁺	C ₈ H ₁₄ NCl (9-Azabicyclo[3.3.1]nonane, 9-chloro-)	73322-95-9	**	8.55 (V)	PE	5091
	C ₈ H ₁₄ NCl (8-Azabicyclo[3.2.1]octane, 3-chloro-8-methyl- <i>endo</i> -)	13514-03-9	**	8.1±0.15	EI	5401
	C ₈ H ₁₄ NCl (8-Azabicyclo[3.2.1]octane, 3-chloro-8-methyl- <i>exo</i> -)	2292-12-8	**	8.3±0.15	EI	5401
C₉H₁₈NCl⁺	C ₅ H ₁₀ N(CH ₃) ₄ Cl (Piperidine, 1-chloro-2,2,6,6-tetramethyl-)	32579-76-3	**	7.64	PE	4278
C₁₃H₁₀NCl⁺	C ₆ H ₄ ClC(=CH ₂)C ₅ H ₄ N (Pyridine, 2-[1-(2-chlorophenyl)ethenyl]-)	XXXXXX-XX-X	**	8.55	EI	5570
	C ₆ H ₄ ClC(=CH ₂)C ₅ H ₄ N (Pyridine, 2-[1-(4-chlorophenyl)ethenyl]-)	XXXXXX-XX-X	**	8.58	EI	5570
C₁₆H₁₂NCl⁺	C ₆ H ₄ (Cl)C ₃ H ₃ (CN)C ₆ H ₅ (Cyclopropanecarbonitrile, 1-(<i>p</i> -chlorophenyl)-2-phenyl-)	32589-55-2	**	8.18±0.10	EI	3575
C₃₂H₂₁NCl⁺	C ₅ (C ₆ H ₅) ₂ (NC ₅ H ₅)(C ₁₀ H ₆)Cl (Cyclopenta-1,3-diene, 1,4-diphenyl-5-pyridinium-2,3-(naphtha-1,8-diyl), chloride)	XXXXXX-XX-X	**	6.75	CTS	5593
C₃₆H₂₃NCl⁺	C ₅ (C ₆ H ₅) ₂ (NC ₉ H ₇)(C ₁₀ H ₆)Cl (Cyclopenta-1,3-diene, 1,4-diphenyl-5-quinolinium-2,3-(naphtha-1,8-diyl), chloride)	XXXXXX-XX-X	**	6.70	CTS	5593
	C ₅ (C ₆ H ₅) ₂ (NC ₉ H ₇)(C ₁₀ H ₆)Cl (Cyclopenta-1,3-diene, 1,4-diphenyl-5-isoquinolinium-2,3-(naphtha-1,8-diyl), chloride)	XXXXXX-XX-X	**	6.72	CTS	5593
C₆H₁₁N₂Cl⁺	C ₃ H ₂ N ₂ Cl(CH ₃) ₃ (3H-Pyrazole, 3-chloro-4,5-dihydro-3,5,5-trimethyl-)	55204-46-1	**	9.04 (V)	PE	4429
C₇H₅N₂Cl⁺	C ₆ H ₄ CN ₂ HCl (1H-Indazole, 3-chloro-)	29110-74-5	**	8.41 (V)	PE	5396

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_9H_{10}N_2Cl^+$	$C_6H_4(Cl)N=CHN(CH_3)_2$ (Methanimidamide, <i>N'</i> -(2-chlorophenyl)- <i>N,N</i> -dimethyl-)	2103-49-3	H	8.9	EI	4337
$C_9H_{11}N_2Cl^+$	$C_6H_4(Cl)N=CHN(CH_3)_2$ (Methanimidamide, <i>N'</i> -(2-chlorophenyl)- <i>N,N</i> -dimethyl-)	2103-49-3	**	7.3 ± 0.1	EI	4359
			**	7.3	EI	4337
$C_{10}H_{13}N_2Cl^+$	$C_6H_4(Cl)(CH_3)N=CHN(CH_3)_2$ (Methanimidamide, <i>N'</i> -(2-chloro-4-methylphenyl)- <i>N,N</i> -dimethyl-)	53666-35-6	**	7.1 ± 0.1	EI	4359
	$C_6H_4(Cl)(CH_3)N=CHN(CH_3)_2$ (Methanimidamide, <i>N'</i> -(2-chloro-5-methylphenyl)- <i>N,N</i> -dimethyl-)	53666-41-4	**	7.1 ± 0.1	EI	4359
$C_{12}H_9N_2Cl^+$	$C_6H_5NNC_6H_4Cl$ (Diazine, (4-chlorophenyl)phenyl-(E)-)	6141-95-3	**	8.55 ± 0.05 (V)	PE	5320
$C_{33}H_{20}N_2Cl^+$	$C_3(C_6H_5)_2(NC_5H_4CN)(C_{10}H_6)Cl$ (Cyclopenta-1,3-diene, 1,4-diphenyl-5-(4-cyanopyridinium)-2,3-(naphtha-1,8-diyl), chloride)	XXXXX-XX-X	**	6.72	CTS	5593
$C_2H_2N_3Cl^+$	$C_2H_2N_3Cl$ (1H-1,2,4-Triazole, 3-chloro-)	6818-99-1	**	10.1 (V)	PE	5228
$C_3H_4N_3Cl^+$	$C_2N_3Cl(CH_3)$ (1H-1,2,4-Triazole, 3-chloro-5-methyl-)	15285-15-1	**	9.6 (V)	PE	5228
	$C_2HN_3Cl(CH_3)$ (1H-1,2,4-Triazole, 3-chloro-1-methyl-)	56616-92-3	**	9.7 (V)	PE	5228
	$C_2HN_3Cl(CH_3)$ (1H-1,2,4-Triazole, 5-chloro-1-methyl-)	56616-99-0	**	9.75 (V)	PE	5228
	$C_2HN_3Cl(CH_3)$ (4H-1,2,4-Triazole, 3-chloro-4-methyl-)	56616-87-6	**	9.8 (V)	PE	5228
$C_4H_6N_3Cl^+$	$C_2N_3Cl(CH_3)_2$ (1H-1,2,4-Triazole, 3-chloro-1,5-dimethyl-)	56616-94-5	**	9.4 (V)	PE	5228
	$C_2N_3Cl(CH_3)_2$ (1H-1,2,4-Triazole, 5-chloro-1,3-dimethyl-)	56616-97-8	**	9.35 (V)	PE	5228
	$C_2N_3Cl(CH_3)_2$ (4H-1,2,4-Triazole, 3-chloro-4,5-dimethyl-)	56616-85-4	**	9.3 (V)	PE	5228
$C_6H_4N_3Cl^+$	$C_4H_2N_2ClC_2H_2N$ (Imidazo[1,2- <i>b</i>]pyridazine, 6-chloro-)	6775-78-6	**	8.55 (V)	PE	5396
$C_9H_{10}N_3Cl^+$	$C_6H_4CINC_3H_3N_2H_2$ (Imidazolidine, 2-(2-chlorophenylimino)-)	XXXXX-XX-X	**	7.96 (V)	PE	5545
$C_{11}H_{16}N_3Cl^+$	$C_6H_4(Cl)(N(CH_3)_2)N=CHN(CH_3)_2$ (Methanimidamide, <i>N'</i> -[2-chloro-4-(dimethylamino)phenyl]- <i>N,N</i> -dimethyl-)	53666-30-1	**	6.4 ± 0.1	EI	4359
	$C_6H_4(Cl)(N(CH_3)_2)N=CHN(CH_3)_2$ (Methanimidamide, <i>N'</i> -[2-chloro-5-(dimethylamino)phenyl]- <i>N,N</i> -dimethyl-)	53666-39-0	**	6.4 ± 0.1	EI	4359
$C_{12}H_8N_3Cl^+$	$C_4H_2N_2ClC_2HNC_6H_5$ (Imidazo[1,2- <i>b</i>]pyridazine, 6-chloro-2-phenyl-)	1844-53-7	**	8.09 (V)	PE	5396

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$\text{CH}_3\text{NCl}_2^+$	CH_3NCl_2	7651-91-4	**	9.35 ± 0.02	PE	4737
			**	10.06 ± 0.10 (V)	PE	4741
$\text{C}_5\text{H}_3\text{NCl}_2^+$	$\text{Cl}_2\text{C}_5\text{H}_3\text{N}$ (Pyridine, 3,5-dichloro-)	2457-47-8	**	9.88 (V)	PE	5527
$\text{C}_6\text{H}_3\text{NCl}_2^+$	$\text{C}_6\text{H}_3(\text{Cl})_2\text{NH}_2$ (Benzenamine, 2,6-dichloro-)	608-31-1	**	7.60 ± 0.02	PE	3890
	$\text{C}_6\text{H}_3\text{Cl}_2\text{NHCOCCH}_3$ (Acetamide, <i>N</i> -(2,4-dichlorophenyl)-)	6975-29-7	$\text{CH}_2 = \text{C} = \text{O}$	10.09 ± 0.03	EI	3480
	$\text{C}_6\text{H}_3\text{Cl}_2\text{NHCOCCH}_3$ (Acetamide, <i>N</i> -(2,6-dichlorophenyl)-)	17700-54-8	$\text{CH}_2 = \text{C} = \text{O}$	9.93 ± 0.03	EI	3480
$\text{C}_8\text{H}_{10}\text{N}_2\text{Cl}_2^+$	$\text{C}_6\text{Cl}_4(\text{CH}_3)_2(\text{NH}_2)_2$ (1,4-Benzenediamine, 2,5-dichloro-3,6-dimethyl-)	40200-66-6	**	6.86 ± 0.03	PI	5552
$\text{C}_{10}\text{H}_{10}\text{N}_2\text{Cl}_2^+$	$\text{C}_6\text{H}_3(\text{Cl})_2\text{CH}_2\text{C}_3\text{H}_5\text{N}_2$ (1H-Imidazole, 2-[(2,6-dichlorophenyl)methyl]-4,5-dihydro-)	52115-81-8	**	8.42 (V)	PE	5096
$\text{C}_{11}\text{H}_{12}\text{N}_2\text{Cl}_2^+$	$\text{C}_{11}\text{H}_{12}\text{N}_2\text{Cl}_2$ (1H-Imidazole, 2-[(2,6-dichlorophenyl)methyl]-4,5-dihydro-1-methyl-)	65248-67-1	**	8.21 (V)	PE	5096
$\text{C}_9\text{H}_9\text{N}_3\text{Cl}_2^+$	$\text{C}_6\text{H}_3\text{Cl}_2\text{NC}_3\text{H}_4\text{N}_2\text{H}_2$ (Imidazolidine, 2-(2,6-dichlorophenylimino)-)	XXXXXX-XX-X	**	8.01 (V)	PE	5545
$\text{C}_{11}\text{H}_{13}\text{N}_3\text{Cl}_2^+$	$\text{C}_6\text{H}_3\text{Cl}_2\text{NC}_3\text{H}_4\text{N}_2(\text{CH}_3)_2$ (Imidazolidine, 2-(2,6-dichlorophenylimino)-1,3-dimethyl-)	XXXXXX-XX-X	**	7.84 (V)	PE	5545
$\text{BC}_5\text{H}_7\text{NCl}^+$	$\text{C}_5\text{H}_4\text{N}(\text{Cl})\text{BH}_3$ (Pyridine, 4-chloro-, compound with borane (1:1))	56898-52-3	**	9.71 (V)	PE	4536
$\text{BC}_4\text{H}_{12}\text{N}_2\text{Cl}^+$	$\text{B}(\text{N}(\text{CH}_3)_2)_2\text{Cl}$	6562-41-0	**	8.15 (V)	PE	3704
			**	8.08	PE	3584
$\text{BC}_2\text{H}_6\text{NCl}_2^+$	$(\text{CH}_3)_2\text{NBCl}_2$	1113-31-1	**	9.56	PE	3584
			**	9.68 (V)	PE	3704
$\text{B}_2\text{C}_4\text{H}_{12}\text{N}_2\text{Cl}_2^+$	$(\text{ClCH}_2\text{BNCH}_3)_2$	73775-16-3	**	9.48 (V)	PE	5628
$\text{B}_2\text{C}_3\text{H}_9\text{N}_3\text{Cl}_2^+$	$\text{N}_3\text{B}_2\text{Cl}_2(\text{CH}_3)_3$ (1,2,4,3,5-Triazadiborolidine, 3,5-dichloro-1,2,4-trimethyl-)	53246-09-6	**	8.22 (V)	PE	4526
$\text{B}_2\text{C}_4\text{H}_{12}\text{N}_4\text{Cl}_2^+$	$\text{B}_2\text{N}_3(\text{CH}_3)_4\text{Cl}_2$ (1,2,4,5,3,6-Tetrazadiborine, 3,6-dichlorohexahydro-1,2,4,5-tetramethyl-)	54196-15-5	**	7.61 (V)	PE	4299
$\text{B}_3\text{C}_3\text{H}_9\text{N}_3\text{Cl}_3^+$	$(\text{CH}_3)_3\text{B}_3\text{N}_3\text{Cl}_3$ (Borazine, 2,4,6-trichloro-1,3,5-trimethyl-)	703-86-6	**	9.45 (V)	PE	3943

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
OCI⁺ (¹ Σ ⁺)	ClO	14989-30-1	**	11.01±0.01 (V)	PE	4944
O₂Cl⁺	ClO ₂	10049-04-4	**	10.36±0.02	PE	3499
(² A ₁)			**	10.5±0.1 (V)	PE	3671
(¹ B ₂)			**	15.5±0.1 (V)	PE	3671
OCI₂⁺	Cl ₂ O	7791-21-1	**	11.02 (V)	PE	3694
(² B ₁)			**	12.37 (V)	PE	3694
(² B ₂)			**	12.65 (V)	PE	3694
(² A ₁)			**	12.79 (V)	PE	3694
(² A ₂)			**	15.9 (V)	PE	4763
(² B ₁)			**	15.90 (V)	PE	3694
			**	16.6 (V)	PE	4763
HOCl⁺	HOCl	7790-92-3	**	11.12±0.01	PE	4763
(² A'')			**	12.09±0.01	PE	4763
(² A')			**	14.6±0.1 (V)	PE	4763
(² A'')			**	15.6±0.1 (V)	PE	4763
COCl⁺	COCl ₂	75-44-5	Cl	11.2±0.2	PI	5041
COCl₂⁺	COCl ₂	75-44-5	**	~11.2	PE	3726
			**	11.55±0.02	PE	3667
			**	11.84 (V)	PE	5041
C₂OCl₂⁺	Cl ₂ C=C=O	4591-28-0	**	9.07±0.02 (V)	PE	5030
C₂O₂Cl₂⁺	(COCl) ₂	79-37-8	**	10.91±0.05	PE	4696
			**	11.26 (V)	PE	5549
C₄O₂Cl₂⁺	C ₄ (Cl) ₂ (=O) ₂ (3-Cyclobutene-1,2-dione, 3,4-dichloro-)	2892-63-9	**	9.89 (V)	PE	4861
C₂OCl₃⁺	(CCl ₃) ₂ CO	116-16-5		12.0	EI	3550
C₂OCl₄⁺	CCl ₃ COCl	76-02-8	**	11.31 (V)	PE	4547
C₆O₂Cl₄⁺	C ₆ Cl ₄ O ₂ (2,5-Cyclohexadiene, 1,4-dione, 2,3,5,6-tetrachloro-)	118-75-2	**	9.90±0.05 (V)	PE	5558
C₈O₃Cl₄⁺	C ₈ O ₃ Cl ₄ (1,3-Isobenzofurandione, 4,5,6,7-tetrachloro-)	117-08-8	**	10.77±0.2	EI	3583
C₂HOCl⁺	CHCl=C=O	29804-89-5	**	9.35 (V)	PE	5610
C₂H₃OCl⁺	CH ₃ COCl	75-36-5	**	10.85±0.05	PE	4220
			**	11.03 (V)	PE	4513

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₂H₃OCl⁺	CH ₃ COCl	75-36-5	**	11.03 (V)	PE	4547
	CH ₂ ClCHO	107-20-0	**	10.61 (V)	PE	4513
			**	10.61 (V)	PE	4547
C₂H₅OCl⁺	CH ₂ ClCH ₂ OH	107-07-3	**	10.90 (V)	PE	5088
	(CH ₃) ₂ O·HCl	XXXXX-XX-X	**	10.6±0.2 (V)	PE	4774
C₃H₅OCl⁺	CH ₃ COCH ₂ Cl	78-95-5	**	9.91±0.03	PI	3765
			**	9.93±0.02 (V)	PE	4524
	C ₂ H ₅ OCH ₂ Cl (Oxirane, (chloromethyl)-)	106-89-8	**	10.60 (V)	PE	4747
C₃H₇OCl⁺	CH ₂ ClCH ₂ OCH ₃	627-42-9	**	10.05 (V)	PE	5088
C₆H₄OCl⁺	C ₆ H ₄ ClOCH ₃ (Benzene, 1-chloro-3-methoxy-)	2845-89-8	CH ₃	11.89±0.1	EI	3446
	C ₆ H ₄ ClOCH ₃ (Benzene, 1-chloro-4-methoxy-)	623-12-1	CH ₃	11.84±0.1	EI	3446
	C ₆ H ₄ ClNO ₂ (Benzene, 1-chloro-3-nitro-)	121-73-3	NO	10.31±0.1	EI	3447
	C ₆ H ₄ ClNO ₂ (Benzene, 1-chloro-4-nitro-)	100-00-5	NO	10.61±0.1	EI	3447
C₆H₅OCl⁺	C ₆ H ₄ ClOOCCH ₃ (Acetic acid, 2-chlorophenyl ester)	4525-75-1	CH ₂ =C=O	9.19±0.03	EI	3483
	C ₆ H ₄ ClOOCCH ₃ (Acetic acid, 3-chlorophenyl ester)	13031-39-5	CH ₂ =C=O	10.11±0.2	EI	3484
	C ₆ H ₄ ClOOCCH ₃ (Acetic acid, 4-chlorophenyl ester)	876-27-7	CH ₂ =C=O	9.60±0.03	EI	3483
			CH ₂ =C=O	10.17±0.2	EI	3484
C₇H₄OCl⁺	ClC ₆ H ₄ COCH ₃ (Ethanone, 1-(4-chlorophenyl))	99-91-2	CH ₃	10.34±0.03	EI	5059
	C ₆ H ₅ COC ₆ H ₄ Cl (Methanone, (2-chlorophenyl)phenyl-)	5162-03-8		11.4±0.1	EI	4335
				11.4±0.1	EI	4358
	C ₆ H ₅ COC ₆ H ₄ Cl (Methanone, (3-chlorophenyl)phenyl-)	1016-78-0	**	11.75±0.1	EI	4335
				11.75±0.1	EI	4358
	C ₆ H ₅ COC ₆ H ₄ Cl (Methanone, (4-chlorophenyl)phenyl-)	134-85-0		11.65±0.1	EI	4358
			**	11.65±0.2	EI	4335
C₇H₅OCl⁺	C ₆ H ₅ COCl (Benzoyl chloride)	98-88-4	**	9.85	EI	3792
C₇H₇OCl⁺	C ₆ H ₄ ClOCH ₃ (Benzene, 1-chloro-3-methoxy-)	2845-89-8	**	8.72±0.1	EI	3446
	C ₆ H ₄ ClOCH ₃ (Benzene, 1-chloro-4-methoxy-)	623-12-1	**	8.18	EI	3845
			**	8.52±0.1	EI	3446

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_7H_{11}OCl^+$	$C_6H_9ClO(CH_3)$ (Cyclohexanone, 2-chloro-2-methyl-)	10409-46-8	**	9.41	PE	5085
$C_8H_7OCl^+$	$C_6H_4(Cl)COCH_3$ (Ethanone, 1-(4-chlorophenyl)-)	99-91-2	**	9.60 ± 0.05 (V)	PE	5097
$C_8H_9OCl^+$	$C_6H_5OCH_2CH_2Cl$ (Benzene, 2-chloroethoxy-)	622-86-6	**	8.50	EI	5083
$C_{10}H_{17}OCl^+$	$C_6H_9ClO(tert-C_4H_9)$ (Cyclohexanone, cis-2-chloro-4-(1,1-dimethylethyl)-)	16508-33-1	**	9.48	PE	5085
$C_{13}H_9OCl^+$	$C_6H_5COC_6H_4Cl$ (Methanone, (2-chlorophenyl)phenyl-)	5162-03-8	**	9.55 ± 0.1	EI	4335
			**	9.55 ± 0.1	EI	4358
	$C_6H_5COC_6H_4Cl$ (Methanone, (3-chlorophenyl)phenyl-)	1016-78-0	**	9.55 ± 0.1	EI	4335
			**	9.55 ± 0.1	EI	4358
	$C_6H_5COC_6H_4Cl$ (Methanone, (4-chlorophenyl)phenyl-)	134-85-0	**	9.6 ± 0.1	EI	4335
			**	9.6 ± 0.1	EI	4358
$C_{13}H_{11}OCl^+$	$C_6H_5CH_2OC_6H_4Cl$ (Benzene, 1-chloro-4-(phenylmethoxy)-)	7700-27-8	**	8.34	CTS	5336
$C_2H_3O_2Cl^+$	$CH_2ClCOOH$	79-11-8	**	10.99 (V)	PE	3874
$C_8H_7O_2Cl^+$	$C_6H_5ClOOCCH_3$ (Acetic acid, 2-chlorophenyl ester)	4525-75-1	**	8.67 ± 0.03	EI	3483
	$C_6H_5ClOOCCH_3$ (Acetic acid, 3-chlorophenyl ester)	13031-39-5	**	8.83 ± 0.2	EI	3484
	$C_6H_4ClOOCCH_3$ (Acetic acid, 4-chlorophenyl ester)	876-27-7	**	8.42 ± 0.03	EI	3483
			**	8.79 ± 0.2	EI	3484
$C_4H_5O_3Cl^+$	$C_2H_5O(CO)_2Cl$	XXXXX-XX-X	**	10.77 (V)	PE	5549
$C_2H_2OCl_2^+$	$CHCl_2CHO$	79-02-7	**	10.83 (V)	PE	4547
	$CH_2ClCOCl$	79-04-9	**	10.30 (V)	PE	4547
$C_6H_4OCl_2^+$	$C_6H_3(Cl)_2OH$ (Phenol, 2,6-dichloro-)	87-65-0	**	8.65 ± 0.02	PE	3890
	$C_6H_3Cl_2OOCCH_3$ (Phenol, 2,4-dichloro-, acetate)	6341-97-5	$CH_2=C=O$	9.37 ± 0.03	EI	3480
	$C_6H_3Cl_2OOCCH_3$ (Phenol, 2,6-dichloro-, acetate)	28165-71-1	$CH_2=C=O$	9.88 ± 0.03	EI	3480
$C_4H_2O_2Cl_2^+$	$C_1H_2Cl_2O_2$ (2,5-Cyclohexadiene-1,4-dione, 2,5-dichloro-)	XXXXX-XX-X	**	10.24 ± 0.03	PI	5505

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_6H_6O_2Cl_2^+$	$C_6H_4Cl_2OOCCH_3$ (Phenol, 2,4-dichloro-, acetate)	6341-97-5	**	8.16 ± 0.03	EI	3480
	$C_6H_3Cl_2OOCCH_3$ (Phenol, 2,6-dichloro-, acetate)	28165-71-1	**	8.68 ± 0.03	EI	3480
$C_2HOCl_3^+$	CCl_3CHO	75-87-6	**	10.88 (V)	PE	4547
	$CHCl_2COCl$	79-36-7	**	11.27 (V)	PE	4547
$C_6H_2O_2Cl_4^+$	$C_6Cl_4(OH)_2$	87-87-6	**	8.30 ± 0.05	PI	5552
	(1,4-Benzenediol, 2,3,5,6-tetrachloro-)					
$NOCl^+$ ($^2A', ^2A''$)	$NOCl$	2696-92-6	**	10.87 ± 0.01	PE	4422
	$NOCl$		**	10.90 ± 0.5	PE	4420
	$NOCl$		**	10.94	PE	4404
NO_2Cl^+	$ClNO_2$	13444-90-1	**	11.84	PE	4404
$CNOCl^+$	$ClNCO$	13858-09-8	**	10.72 ± 0.01	PE	5001
$C_8N_2O_2Cl_2^+$	$C_6Cl_2O_2(CN)_2$	84-58-2	**	10.58 ± 0.05 (V)	PE	5558
	(1,4-Cyclohexadiene, 1,2-dicarbonitrile, 4,5-dichloro-3,6-dioxo-)					
$CNOCl_3^+$	CCl_3NO	3711-49-7		10.30 ± 0.05 (V)	PE	5298
$C_5NOCl_5^+$	$C_5N(O)(Cl)_5$	17573-93-2	**	8.72 ± 0.02 (V)	PE	4275
	(Pyridine, pentachloro-, 1-oxide)					
$C_3H_6NOCl^+$	$C(CH_3)_2(Cl)NO$	2421-26-3	**	9.13 ± 0.1 (V)	PE	4465
$C_4H_8NOCl^+$	$C_2H_5C(CH_3)(Cl)NO$	681-01-6	**	9.29 ± 0.1 (V)	PE	4465
$C_5H_4NOCl^+$	$C_5H_4N(O)Cl$	1121-76-2	**	8.42 ± 0.02 (V)	PE	4275
	(Pyridine, 4-chloro-, 1-oxide)					
$C_6H_4NOCl^+$	$C_6H_4(Cl)(NO)$	932-98-9	**	9.02 ± 0.1 (V)	PE	4465
	(Benzene, 1-chloro-4-nitroso-)					
$C_6H_{10}NOCl^+$	$C_6H_{10}(Cl)(NO)$	695-64-7	**	9.28 (V)	PE	4465
	(Cyclohexane, 1-chloro-1-nitroso-)					
	<i>trans</i> - $C_6H_{10}(Cl)(NO)$	1809-72-9	**	9.13 (V)	PE	4465
	(Cyclohexane, <i>trans</i> -1-chloro-2-nitroso-)					
$C_7H_4NOCl^+$	$C_6H_4(Cl)(C \equiv NO)$	15500-74-0	**	8.65 (V)	PE	4719
	(Benzonitrile, 4-chloro-N-oxide)					
	$C_6H_4(Cl)NCO$	2909-38-8	**	9.0 ± 0.1 (V)	PE	5026
	(Benzene, 1-chloro-3-isocyanato-)					
	$C_6H_4(Cl)NCO$	104-12-1	**	8.8 ± 0.1 (V)	PE	5026
	(Benzene, 1-chloro-4-isocyanato-)					

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₇H₆NOCl⁺	C ₆ H ₄ (Cl)(CONH ₂) (Benzamide, 3-chloro-)	618-48-4	**	9.34 (V)	PE	4918
	C ₆ H ₄ (Cl)(CONH ₂) (Benzamide, 4-chloro-)	619-56-7	**	9.35 (V)	PE	4918
	C ₆ H ₄ (Cl)NHCHO (Formamide, <i>N</i> -(2-chlorophenyl)-)	2596-93-2	**	8.4±0.1	EI	4359
C₈H₇NOCl⁺	C ₆ H ₃ Cl ₂ NHCOCH ₃ (Acetamide, <i>N</i> -(2,4-dichlorophenyl)-)	6975-29-7		8.81±0.03	EI	3480
	C ₆ H ₃ Cl ₂ NHCOCH ₃ (Acetamide, <i>N</i> -(2,6-dichlorophenyl)-)	17700-54-8		8.79±0.03	EI	3480
C₈H₈NOCl⁺	C ₆ H ₄ ClNHCOCH ₃ (Acetamide, <i>N</i> -(2-chlorophenyl)-)	533-17-5	**	8.55	EI	4834
			**	8.07±0.03	EI	3483
	C ₆ H ₄ ClNHCOCH ₃ (Acetamide, <i>N</i> -(4-chlorophenyl)-)	539-03-7	**	8.07±0.03	EI	3483
	C ₆ H ₃ (Cl)(CH ₃)NHCHO (Formamide, <i>N</i> -(2-chloro-4-methylphenyl)-)	18931-77-6	**	8.1±0.1	EI	4359
	C ₆ H ₃ (Cl)(CH ₃)NHCHO (Formamide, <i>N</i> -(2-chloro-5-methylphenyl)-)	18931-82-3	**	8.2±0.1	EI	4359
C₉H₁₀NOCl⁺	C ₆ H ₄ ClNHCOC ₂ H ₅ (Propanamide, <i>N</i> -(2-chlorophenyl)-)	2760-32-9	**	8.45±0.05	EI	4834
C₉H₁₆NOCl⁺	C ₅ H ₉ N(O)(CH ₃) ₄ Cl (4-Piperidinone, 1-chloro-2,2,6,6-tetramethyl-)	38951-83-6	**	8.01	PE	4278
C₁₀H₁₂NOCl⁺	C ₆ H ₄ ClNHCOC ₂ H ₄ CH ₃ (Butanamide, <i>N</i> -(2-chlorophenyl)-)	33694-15-4	**	8.50±0.05	EI	4834
C₁₀H₁₄NOCl⁺	C ₁₀ H ₁₄ (Cl)(NO) (Tricyclo[3.3.1.1 ^{3,7}]decane, 2-chloro-2-nitroso-)	33673-34-6	**	9.02 (V)	PE	4465
C₁₁H₁₄NOCl⁺	C ₁₁ H ₁₄ NOCl (Butanamide, <i>N</i> -(2-chlorophenyl)-3-methyl-)	62635-51-2	**	8.50±0.05	EI	4834
C₁₂H₈NOCl⁺	C ₆ H ₄ ClCOC ₂ H ₄ N (Methanone, (2-chlorophenyl)-2-pyridinyl-)	1694-57-1	**	8.98	EI	5459
C₁₂H₁₆NOCl⁺	C ₆ H ₄ ClNHCOC ₂ H ₄ C(CH ₃) ₃ (Butanamide, <i>N</i> -(2-chlorophenyl)-3,3-dimethyl-)	XXXXX-XX-X	**	8.40±0.05	EI	4834
C₁₇H₁₄NOCl⁺	C ₆ H ₄ (Cl)C ₅ H ₃ (CN)C ₆ H ₄ (OCH ₃) (Cyclopropanecarbonitrile, 1-(<i>p</i> -chlorophenyl)-2-(<i>p</i> -methoxyphenyl)-)	32589-54-1	**	7.70±0.05	EI	3575
C₄H₃N₂OCl⁺	C ₄ H ₃ N ₂ Cl(=O) (2(1H)-Pyrimidinone, 5-chloro-)	54326-16-8	**	9.78±0.05	EI	5159

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or ^a appearance potential (eV)	Method	Ref.
C₃H₅N₂OCl⁺	C ₃ H ₃ N(O)(Cl)NH ₂ (2-Pyridinamine, 5-chloro-, 1-oxide)	52132-34-0	**	7.98±0.05	EI	4117
	C ₃ H ₂ N ₂ ClOCH ₃ (Pyrimidine, 5-chloro-2-methoxy-)	38373-44-3	**	9.36±0.05	EI	5159
	C ₃ H ₂ N ₂ Cl(=O)CH ₃ (2(1H)-Pyrimidinone, 5-chloro-1-methyl-)	63331-06-6	**	9.03±0.05	EI	5159
C₆H₇N₂OCl⁺	C ₅ H ₃ N(O)(Cl)NHCH ₃ (2-Pyridinamine, 5-chloro- <i>N</i> -methyl-, 1-oxide)	54818-75-6	**	7.61±0.05	EI	4117
	C ₅ H ₃ N(Cl)(=NH)OCH ₃ (2(1 <i>H</i>)-Pyridinimine, 5-chloro-1-methoxy-)	54818-77-8	**	7.40±0.05	EI	4117
C₇H₇N₂OCl⁺	C ₆ H ₅ CINHCONH ₂ (Urea, (2-chlorophenyl)-)	114-38-5	**	8.45	EI	4834
C₈H₅N₂OCl⁺	ClC ₆ H ₄ C(=O)CHN ₂ (Ethanone, 1-(2-chlorophenyl)-2-diazo-)	XXXXX-XX-X	**	8.60±0.05 (V)	PE	5326
	ClC ₆ H ₄ C(=O)CHN ₂ (Ethanone, 1-(4-chlorophenyl)-2-diazo-)	3282-33-5	**	9.02±0.05 (V)	PE	5326
C₈H₉N₂OCl⁺	C ₆ H ₄ CINHCONHCH ₃ (Urea, <i>N</i> -(2-chlorophenyl)- <i>N'</i> -methyl-)	15500-96-6	**	8.35±0.05	EI	4834
C₉H₁₁N₂OCl⁺	C ₆ H ₄ (Cl)(N(CH ₃) ₂)NHCHO (Formamide, <i>N</i> -[2-chloro-5-(dimethylamino)phenyl]-)	53666-46-9	**	6.7±8.1	EI	4359
	C ₆ H ₄ CINHCONHC ₂ H ₅ (Urea, <i>N</i> -(2-chlorophenyl)- <i>N'</i> -ethyl-)	62635-53-4	**	8.25±0.05	EI	4834
C₁₀H₁₃N₂OCl⁺	C ₆ H ₄ (Cl)(OCH ₃)N=CHN(CH ₃) ₂ (Methanimidamide, <i>N'</i> -(2-chloro-4-methoxyphenyl)- <i>N,N</i> -dimethyl-)	53666-34-5	**	7.0±0.1	EI	4359
	C ₆ H ₄ (Cl)(OCH ₃)N=CHN(CH ₃) ₂ (Methanimidamide, <i>N'</i> -(2-chloro-5-methoxyphenyl)- <i>N,N</i> -dimethyl-)	53666-40-3	**	7.1±0.1	EI	4359
	C ₆ H ₄ CINHCONHCH(CH ₃) ₂ (Urea, <i>N</i> -(2-chlorophenyl)- <i>N'</i> -(1-methylethyl)-)	62635-47-6	**	8.15±0.05	EI	4834
C₁₁H₁₅N₂OCl⁺	C ₆ H ₄ CINHCONHC(CH ₃) ₃ (Urea, <i>N</i> -(2-chlorophenyl)- <i>N'</i> -(1,1-dimethylethyl)-)	62635-48-7	**	8.05±0.05	EI	4834
C₁₂H₇N₂OCl⁺	C ₁₂ H ₇ N ₂ OCl (Phenazine, 2-chloro-10-oxide)	1019-15-4	**	8.16 (V)	PE	4590
	C ₁₂ H ₇ N ₂ OCl (Phenazine, 2-chloro-5-oxide)	1211-09-2	**	8.20 (V)	PE	4590
C₄H₄NO₂Cl⁺	C ₃ H ₃ N(=O) ₂ (Cl) (2,5-Pyrroledione, 1-chloro-)	128-09-6	**	10.29 (V)	PE	4742
			**	10.29 (V)	PE	4810
C₅H₈NO₂Cl⁺	C ₃ H ₂ NO(=O)(Cl)(CH ₃) ₂ (2-Oxazolidinone, 3-chloro-4,4-dimethyl-)	58629-01-9	**	9.68 (V)	PE	4742

Table of Ion Energetics Measurements—Continued

Ion	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_6H_4NO_2Cl^+$	$C_6H_4ClNO_2$ (Benzene, 1-chloro-3-nitro-)	121-73-3	**	9.92 ± 0.1	EI	3447
	$C_6H_4ClNO_2$ (Benzene, 1-chloro-4-nitro-)	100-00-5	**	9.96 ± 0.1	EI	3447
$C_8H_8NO_2Cl^+$	$C_6H_3(Cl)(OCH_3)NHCHO$ (Formamide, <i>N</i> -(2-chloro-4-methoxyphenyl)-)	53666-45-8	**	8.0 ± 0.1	EI	4359
	$C_6H_3(Cl)(OCH_3)NHCHO$ (Formamide, <i>N</i> -(2-chloro-5-methoxyphenyl)-)	53666-47-0	**	8.0 ± 0.1	EI	4359
$C_8H_{16}NO_2Cl^+$	$C_8H_{16}NO_2Cl$	61542-18-5	**	9.48 (V)	PE	4772
$C_9H_{18}NO_2Cl^+$	$C_9H_{18}NO_2Cl$	61542-20-9	**	9.38 (V)	PE	4772
$C_{10}H_{20}NO_2Cl^+$	$C_{10}H_{20}NO_2Cl$	59660-96-7	**	9.42 (V)	PE	4941
	$C_{12}H_{24}NO_2Cl$	59660-97-8	**	9.35 (V)	PE	4772
$C_{11}H_8NO_2Cl^+$	$ClC_6H_3C_3O_2NC_5H_5$ (Pyridinium, 4-chloro-1,3-dihydro-1,3-dioxo-2H-inden-2-ylide)	59804-79-4	**	7.65	CTS	5592
	$ClC_6H_3C_3O_2NC_5H_5$ (Pyridinium, 5-chloro-1,3-dihydro-1,3-dioxo-2H-inden-2-ylide)	59805-03-7	**	7.70	CTS	5592
$C_9H_{10}N_3O_2Cl^+$	$C_6H_3(Cl)(NO_2)N=CHN(CH_3)_2$ (Methanimidamide, <i>N'</i> -(2-chloro-4-nitrophenyl)- <i>N,N</i> -dimethyl-)	53666-38-9		7.9 ± 0.1	EI	4359
	$C_6H_3(Cl)(NO_2)N=CHN(CH_3)_2$ (Methanimidamide, <i>N'</i> -(2-chloro-5-nitrophenyl)- <i>N,N</i> -dimethyl-)	53666-43-6	**	7.7 ± 0.1	EI	4359
$C_7H_5N_2O_3Cl^+$	$C_6H_3(Cl)(NO_2)NHCHO$ (Formamide, <i>N</i> -(2-chloro-4-nitrophenyl)-)	16135-32-3	**	9.3 ± 0.1	EI	4359
	$C_6H_3(Cl)(NO_2)NHCHO$ (Formamide, <i>N</i> -(2-chloro-5-nitrophenyl)-)	53666-48-1	**	9.0 ± 0.1	EI	4359
$C_8H_7NOCl_2^+$	$C_6H_3Cl_2NHCOCH_3$ (Acetamide, <i>N</i> -(2,4-dichlorophenyl)-)	6975-29-7	**	8.09 ± 0.03	EI	3480
	$C_6H_3Cl_2NHCOCH_3$ (Acetamide, <i>N</i> -(2,6-dichlorophenyl)-)	17700-54-8	**	8.25 ± 0.03	EI	3480
$C_8H_{15}NO_2Cl_2^+$	$C_8H_{15}NO_2Cl_2$	61542-19-6	**	9.52 (V)	PE	4772
$C_9H_{17}NO_2Cl_2^+$	$C_9H_{17}NO_2Cl_2$	61542-21-0	**	9.56 (V)	PE	4772
$C_{10}H_{19}NO_2Cl_2^+$	$C_{10}H_{19}NO_2Cl_2$	59661-02-8	**	9.54 (V)	PE	4772
$C_{12}H_{23}NO_2Cl_2^+$	$C_{12}H_{23}NO_2Cl_2$	59661-03-9	**	9.59 (V)	PE	4772
$C_8H_8N_2O_2Cl_2^+$	$C_6Cl_2(NH_2)(NO_2)(CH_3)_2$ (Benzenamine, 2,5-dichloro-3,6-dimethyl-4-nitro-)	40331-38-2	**	8.17 ± 0.03	PI	5552

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₈H₆N₂O₄Cl₂⁺	C ₆ Cl ₂ (NO ₂) ₂ (CH ₃) ₂ (Benzene, 1,3-dichloro-4,6-dimethyl-2,5-dinitro-)	40200-67-7	**	9.52±0.02	PI	5552
	C ₆ Cl ₂ (NO ₂) ₂ (CH ₃) ₂ (Benzene, 1,4-dichloro-2,5-dimethyl-3,6-dinitro-)	40115-57-9	**	9.47±0.02	PI	5552
C₂H₂NOCl₃⁺	CCl ₃ CONH ₂	594-65-0	**	10.53 (V)	PE	4803
	C ₆ H ₆ NOCl ₃	59403-01-9	**	8.66 (V)	PE	4803
FCI⁺ (² Π _{3/2p}) (² Π _{1/2}) (² Π _{1/2p}) (² Π _{1/2}) (² Π ₀) (² Σ ⁺)	ClF	7790-89-8	**	12.66±0.01	PE	3507
			**	12.66±0.01	PE	3680
			**	12.74±0.01	PE	3507
			**	12.74±0.01	PE	3680
			**	16.39±0.01	PE	3507
			**	17.80±0.01	PE	3507
	³⁵ ClF	21377-80-0	**	12.60±0.05	EI	5620
F₂³⁷Cl⁺	³⁵ ClF ₂	24801-48-7	**	12.77±0.05	EI	5620
	³⁵ ClF ₃	7790-91-2	F	13.78±0.07	EI	5620
F₃Cl⁺	ClF ₃	7790-91-2	**	12.65±0.05	PE	3680
			**	13.05±0.05 (V)	EI	5620
BeFCI⁺	BeFCI	13598-12-4	**	13.0±1.0	EI	4113
BFCI⁺	BClF	22395-93-3	**	11±1	EI	3465
BF₂Cl⁺	BClF ₂	14720-30-0	**	13±1	EI	3465
BFCl₂⁺	BCl ₂ F	14720-31-1	**	14.1	EI	3465
CFCI⁺	CF ₃ Cl	75-72-9	F ₂	19.75±0.2	PI	5399
	C ₂ F ₃ Cl	79-38-9	CF ₂	15.0±0.1	EI	3539
	CF ₂ Cl ₂	75-71-8	F ⁻ +Cl	15.20±0.3	PI	5399
				17.76	PI	4757
				15.3±0.15	EI	3539
	CFCl=CFCI	598-88-9	CFCI	15.95±0.05	PI	5399
	CFCl ₃	75-69-4	Cl ₂	16.0	PI	5196
			Cl ₂	16.02±0.04	PI	4757
				17.1±0.1	EI	3539
			2Cl	16.8±0.1	EI	3539
	CH ₂ =CFCI	2317-91-1	CH ₂			
CF₂Cl⁺	CF ₃ Cl	75-72-9	F	14.0±0.3	PI	5175
			F	14.25	PI	5196
	C ₂ F ₃ Cl	79-38-9	CF	14.9±0.1	EI	4070
	CF ₂ Cl ₂	75-71-8	Cl ⁻	10.60±0.02	PI	5399
			Cl	12.10	PI	5196
			Cl	11.99	EI	4757
				11.95	EI	3550
	(CF ₂ Cl) ₂ CO	127-21-9				

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_2F_2Cl^+$	C_2F_3Cl	79-38-9	F	15.9 ± 0.2	EI	4070
	$CFCl = CFCI$	598-88-9	Cl	14.8 ± 0.1	EI	4070
CF_3Cl^+	CF_3Cl	75-72-9	**	12.39	PI	4757
			**	12.45	PI	5196
			**	13.0 (V)	PE	3914
			**	13.08 ± 0.01 (V)	PE	4916
			**	13.08 ± 0.02 (V)	PE	4026
$C_2F_3Cl^+$	C_2F_3Cl	79-38-9	**	9.76	S	3776
			**	9.82	PE	3589
			**	10.26 (V)	PE	4303
			**	10.6 ± 0.1	EI	4070
$C_3F_3Cl^+$	$CF_3C \equiv CCl$	673-93-8	**	11.14 ± 0.02	PE	4765
$C_2F_5Cl^+$	CF_3CF_2Cl	76-15-3	**	12.96 (V)	PE	4366
$C_6F_5Cl^+$	C_6F_5Cl (Benzene, chloropentafluoro-)	344-07-0	**	9.72 ± 0.02	PE	5305
				9.94 (V)	PE	5252
$CFCl_2^+$	CF_2Cl_2	75-71-8	F ⁻	12.07 ± 0.05	PI	5399
				13.30 ± 0.05	PI	5399
				13.81	PI	4757
				14.15	PI	5796
	$CFCl = CFCI$	598-88-9	CF	14.3 ± 0.1	EI	4070
	$CFCl_3$	75-69-4	Cl	11.57 ± 0.04	PI	4757
				11.65	PI	5196
$C_2FCl_2^+$	$CFCl = CFCI$	598-88-9	F	15.7 ± 0.1	EI	4070
$CF_2Cl_2^+$	CF_2Cl_2	75-71-8	**	11.75 ± 0.04	PI	4757
			**	11.75	PI	5196
			**	12.24 ± 0.01 (V)	PE	4916
			**	12.3 (V)	PE	3914
			**	12.27 ± 0.02 (V)	EI	4880
$C_2F_2Cl_2^+$	$CF_2 = CCl_2$	79-35-6	**	9.62	PE	3589
			**	9.82 ± 0.02 (V)	EI	4880
	$CFCl = CFCI$	598-88-9	**	10.2 ± 0.1	EI	4070
$C_2F_4Cl_2^+$	$(CF_2Cl)_2$	76-14-2	**	12.47 (V)	PE	4613
			**	12.85 (V)	PE	4366
$CFCl_3^+$	$CFCl_3$	75-69-4	**	11.77 ± 0.01	PE	4365
			**	11.85 (V)	PE	5196
			**	11.9 (V)	PE	3914
			**	11.76 ± 0.01 (V)	PE	4916

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_2F_3Cl_3^+$	$CFCl_2CF_2Cl$	76-13-1	**	12.05 (V)	PE	4366
$C_6F_3Cl_3^+$	$C_6F_3Cl_3$ (Benzene, 1,3,5-trichloro-2,4,6-trifluoro-)	319-88-0	**	9.48 ± 0.02	PE	5305
CH_2FCl^+	CH_2FCl	593-70-4	**	11.74	PE	3914
C_2HFCl^+	$CH_2=CFCl$	2317-91-1	H	16.2 ± 0.2	EI	4070
$C_2H_2FCl^+$	$CH_2=CFCl$	2317-91-1	**	9.97	S	3776
			**	10.7 ± 0.2	EI	3539
			**	10.7 ± 0.2	EI	4070
$C_6H_4FCl^+$	C_6H_4FCl (Benzene, 1-chloro-2-fluoro-)	348-51-6	**	9.16 (V)	PE	4567
			**	9.18 ± 0.02	PE	5305
	C_6H_4FCl (Benzene, 1-chloro-3-fluoro-)	625-98-9	**	9.22 ± 0.02	PE	5305
			**	9.25 (V)	PE	4567
	C_6H_4FCl (Benzene, 1-chloro-4-fluoro-)	352-33-0	**	9.05 (V)	PE	4567
			**	9.08 ± 0.02	PE	5305
CHF_2Cl^+	CHF_2Cl	75-45-6	**	12.6 (V)	PE	3914
$C_2HF_2Cl^+$	$CF_2=CHCl$	359-10-4	**	9.76	S	3776
$C_2H_3F_2Cl^+$	CH_3CF_2Cl	75-68-3	**	12.50 (V)	PE	4366
$C_6H_3F_2Cl^+$	$C_6H_3F_2Cl$ (Benzene, 1-chloro-2,4-difluoro-)	1435-44-5	**	9.17 ± 0.02	PE	5305
	$C_6H_3F_2Cl$ (Benzene, 1-chloro-3,5-difluoro-)	1435-43-4	**	9.40 ± 0.02	PE	5305
	$C_6H_3F_2Cl$ (Benzene, 2-chloro-1,3-difluoro-)	38361-37-4	**	9.37 ± 0.02	PE	5305
	$C_6H_3F_2Cl$ (Benzene, 2-chloro-1,4-difluoro-)	2367-91-1	**	9.19 ± 0.02	PE	5305
	$C_6H_3F_2Cl$ (Benzene, 4-chloro-1,2-difluoro-)	696-02-6	**	9.24 ± 0.02	PE	5305
$C_6H_2F_3Cl^+$	$C_6H_2F_3Cl$ (Benzene, 1-chloro-2,3,4-trifluoro-)	36556-42-0	**	9.42 ± 0.02	PE	5305
	$C_6H_2F_3Cl$ (Benzene, 1-chloro-2,4,5-trifluoro-)	XXXXXX-XX-X	**	9.27 ± 0.02	PE	5305
	$C_6H_2F_3Cl$ (Benzene, 2-chloro-1,3,4-trifluoro-)	39153-73-6	**	9.39 ± 0.02	PE	5305
$C_7H_4F_3Cl^+$	$C_6H_4ClCF_3$ (Benzene, 1-chloro-2-trifluoromethyl-)	88-16-4	**	9.47 (V)	PE	4567
	$C_6H_4ClCF_3$ (Benzene, 1-chloro-3-trifluoromethyl-)	98-15-7	**	9.50 (V)	PE	4567

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₇H₁F₃Cl⁺	C ₆ H ₁ ClCF ₃ (Benzene, 1-chloro-4-trifluoromethyl-)	98-56-6	**	9.56 (V)	PE	4567
C₆HF₄Cl⁺	C ₆ HF ₄ Cl (Benzene, 3-chloro-1,2,4,5-tetrafluoro-)	1835-61-6	**	9.58±0.02	PE	5305
CHFCl₂⁺	CHFCl ₂	75-43-4	**	12.0 (V)	PE	3914
C₆H₃FCl₂⁺	C ₆ H ₃ FCl ₂ (Benzene, 1,2-dichloro-3-fluoro-)	36556-50-0	**	9.29±0.02	PE	5305
	C ₆ H ₃ FCl ₂ (Benzene, 1,2-dichloro-4-fluoro-)	1435-49-0	**	9.16±0.02	PE	5305
	C ₆ H ₃ FCl ₂ (Benzene, 1,3-dichloro-2-fluoro-)	2268-05-5	**	9.32±0.02	PE	5305
	C ₆ H ₃ FCl ₂ (Benzene, 1,3-dichloro-5-fluoro-)	1435-46-7	**	9.39±0.02	PE	5305
	C ₆ H ₃ FCl ₂ (Benzene, 1,4-dichloro-2-fluoro-)	348-59-4	**	9.09±0.02	PE	5305
	C ₆ H ₃ FCl ₂ (Benzene, 2,4-dichloro-1-fluoro-)	1435-48-9	**	9.12±0.02	PE	5305
C₆H₂F₂Cl₂⁺	C ₆ H ₂ F ₂ Cl ₂ (Benzene, 1,2-dichloro-3,4-difluoro-)	36556-39-5	**	9.33±0.02	PE	5305
	C ₆ H ₂ F ₂ Cl ₂ (Benzene, 1,3-dichloro-2,4-difluoro-)	36556-37-3	**	9.27±0.02	PE	5305
	C ₆ H ₂ F ₂ Cl ₂ (Benzene, 1,3-dichloro-2,5-difluoro-)	2367-80-8	**	9.32±0.02	PE	5305
	C ₆ H ₂ F ₂ Cl ₂ (Benzene, 1,4-dichloro-2,5-difluoro-)	XXXXXX-XX-X	**	9.17±0.02	PE	5305
	C ₆ H ₂ F ₂ Cl ₂ (Benzene, 2,3-dichloro-1,4-difluoro-)	36556-54-4	**	9.32±0.02	PE	5305
C₂HF₃Cl₂⁺	CF ₂ ClCHFCI	354-23-4	**	12.00 (V)	PE	4366
C₆HF₃Cl₂⁺	C ₆ HF ₃ Cl ₂ (Benzene, 2,4-dichloro-1,3,5-trifluoro-)	2368-53-8	**	9.37±0.02	PE	5305
C₆H₂FCl₃⁺	C ₆ H ₂ FCl ₃ (Benzene, 1,2,3-trichloro-4-fluoro-)	36556-36-2	**	9.20±0.02	PE	5305
	C ₆ H ₂ FCl ₃ (Benzene, 1,2,4-trichloro-5-fluoro-)	XXXXXX-XX-X	**	9.16±0.02	PE	5305
	C ₆ H ₂ FCl ₃ (Benzene, 1,3,5-trichloro-2-fluoro-)	36556-33-9	**	9.23±0.02	PE	5305
	C ₆ H ₂ FCl ₃ (Benzene, 2,3,5-trichloro-1-fluoro-)	3107-20-8	**	9.24±0.02	PE	5305
C₆HFCl₄⁺	C ₆ HFCl ₄ (Benzene, 1,2,3,4-tetrachloro-5-fluoro-)	2691-93-2	**	9.20±0.02	PE	5305
	C ₆ HFCl ₄ (Benzene, 1,2,4,5-tetrachloro-3-fluoro-)	319-97-1	**	9.19±0.02	PE	5305
O₃FCI⁺	ClO ₃ F	7616-94-6	**	12.945±0.005	PE	3675

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$\text{C}_3\text{OF}_5\text{Cl}^+$	$\text{CClF}_2\text{COCF}_3$	79-53-8	**	11.71 ± 0.02 (V)	PE	4524
$\text{C}_3\text{OF}_3\text{Cl}_3^+$	$\text{CCl}_2\text{FCOCClF}_2$	79-52-7	**	11.21 ± 0.02 (V)	PE	4524
	$\text{CF}_3\text{COCCL}_3$	758-42-9	**	11.24 ± 0.02 (V)	PE	4524
$\text{C}_3\text{HOF}_4\text{Cl}^+$	$\text{CClF}_2\text{COCHF}_2$	920-64-9	**	11.33 ± 0.02 (V)	PE	4524
CNOF_2Cl^+	CF_2ClNO	421-13-6		10.81 ± 0.05 (V)	PE	5298
CNOFCl_2^+	CFCl_2NO	1495-28-9		10.58 ± 0.05 (V)	PE	5298
NaCl^+	NaCl	7647-14-5	**	8.93 ± 0.1	PE	4344
$(^2\text{P}_{3/2})$			**	8.93 ± 0.1	PE	5035
$(^2\text{P}_{3/2})$			**	9.0 (V)	PE	4307
$(^2\text{P}_{1/2})$			**	9.80 ± 0.04 (V)	PE	5035
Na_2Cl_2^+	$(\text{NaCl})_2$	12258-98-9	**	10.30 (V)	PE	4344
			**	10.30 (V)	PE	5035
MgCl_2^+	MgCl_2	7786-30-3	**	10.5 (V)	PE	4761
AlCl^+	AlCl	13595-81-8	**	9.4	PE	4860
AlCl_3^+	AlCl_3	7446-70-0	**	12.01 (V)	PE	4398
			**	12.01 (V)	PE	4256
Al_2Cl_6^+	$(\text{AlCl}_3)_2$	13845-12-0	**	12.18 (V)	PE	4559
			**	12.18 (V)	PE	4256
$\text{C}_2\text{H}_6\text{AlCl}^+$	$(\text{CH}_3)_2\text{ClAl}$	1184-58-3	**	10.25 (V)	PE	4398
$\text{C}_4\text{H}_{12}\text{Al}_2\text{Cl}_2^+$	$((\text{CH}_3)_2\text{ClAl})_2$	12073-96-0	**	10.09 (V)	PE	4559
$\text{H}_4\text{NAICl}_4^+$	NH_4AlCl_4	7784-14-7	**	10.56 ± 0.06 (V)	PE	5238
OAlCl^+	AlOCl	13596-11-7	**	12 ± 1	EI	3462
SiCl^+	SiCl_2	13569-32-9	Cl	12.50 ± 0.10	EI	5188
	SiCl_4	35880-05-8		19.20 ± 0.10	EI	5188
	$\text{Cl}_3\text{SiCo}(\text{Co})_2(\text{PF}_3)_2$	37769-29-2		16.4 ± 0.5	EI	3653
	$\text{Cl}_3\text{SiCo}(\text{CO})_3\text{PF}_3$	37769-28-1		16.2 ± 0.5	EI	3653
SiCl_2^+	SiCl_2	13569-32-9	**	10.93 ± 0.10	EI	5188
	SiCl_4	35880-05-8		17.64 ± 0.10	EI	5188

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
SiCl_3^+	SiCl_4	15056-28-7	Cl	12.6 ± 0.1	EI	5276
	Si_2Cl_6	13465-77-5	SiCl_3	11.4 ± 0.1	EI	5276
	SiHCl_3	10025-78-2	H	11.9 ± 0.1	EI	5276
	$\text{C}_6\text{H}_5\text{SSiCl}_3$ (Silane, trichloro(phenylthio)-)	7579-91-1		11.43 ± 0.1	EI	4198
SiCl_4^+	SiCl_4	10026-04-7	**	12.06 (V)	PE	3514
			**	11.8	PE	5276
			**	11.44 ± 0.10	EI	5188
Si_2Cl_6^+	Si_2Cl_6	13465-77-5	**	10.4	PE	5276
			**	11.0 ± 0.3	EI	5188
H_3SiCl^+	SiH_3Cl	13465-78-6	**	11.61 ± 0.02 (V)	PE	3510
			**	11.61 ± 0.05 (V)	PE	3502
			**	11.65 (V)	PE	3511
$\text{H}_2\text{SiCl}_2^+$	SiH_2Cl_2	4109-96-0	**	11.64 ± 0.02 (V)	PE	3510
			**	11.70 (V)	PE	3511
			**	11.70 (V)	PE	3694
HSiCl_3^+	SiHCl_3	10025-78-2	**	11.94 (V)	PE	3511
			**	11.94 (V)	PE	4146
$\text{C}_2\text{H}_6\text{SiCl}^+$	$\text{C}_6\text{H}_5\text{SSi}(\text{CH}_3)_2\text{Cl}$ (Silane, chlorodimethyl(phenylthio)-)	52548-11-5		10.79 ± 0.1	EI	4198
$\text{C}_3\text{H}_9\text{SiCl}^+$	$(\text{CH}_3)_3\text{SiCl}$	75-77-4	**	10.76 (V)	PE	3503
			**	10.84 (V)	PE	4683
			**	10.0	PE	5276
$\text{C}_4\text{H}_9\text{SiCl}^+$	$\text{C}_4\text{H}_8\text{Si}(\text{Cl})\text{CH}_3$ (Silacyclobutane, 1-chloro-1-methyl-)	2351-34-0	**	9.95 (V)	PE	4077
$\text{C}_4\text{H}_{11}\text{SiCl}^+$	$(\text{CH}_3)_3\text{SiCH}_2\text{Cl}$	2344-80-1	**	10.17 ± 0.1 (V)	PE	3830
$\text{C}_5\text{H}_9\text{SiCl}^+$	$(\text{CH}_3)_3\text{SiC}\equiv\text{CCl}$	7652-06-4	**	9.4 ± 0.1	PE	4002
$\text{C}_6\text{H}_{13}\text{SiCl}^+$	<i>tert</i> - $\text{C}_7\text{H}_9\text{Si}(\text{CH}_3)_2\text{Cl}$	18162-48-6	**	9.77 (V)	PE	4683
$\text{C}_7\text{H}_8\text{SiCl}^+$	$\text{C}_6\text{H}_4(\text{Cl})\text{SiH}(\text{CH}_3)_2$ (Silane, (3-chlorophenyl)dimethyl-)	2083-13-8	CH_3	8.90	EI	4125
	$\text{C}_6\text{H}_4(\text{Cl})\text{SiH}(\text{CH}_3)_2$ (Silane, (4-chlorophenyl)dimethyl-)	1432-31-1	CH_3	8.84	EI	4125
$\text{C}_9\text{H}_{13}\text{SiCl}^+$	$\text{ClC}_6\text{H}_4\text{Si}(\text{CH}_3)_3$ (Silane, (4-chlorophenyl)trimethyl-)	10557-71-8	**	9.01 (V)	PE	5380
			**	9.03 (V)	PE	4438

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{10}H_{17}Si_2Cl^+$	$C_6H_4(SiCl(CH_3)_2)SiH(CH_3)_2$ (Silane, chloro[3-(dimethylsilyl)phenyl]dimethyl-)	34259-70-6	**	8.5 ± 0.2	EI	4121
	$C_6H_4(SiCl(CH_3)_2)SiH(CH_3)_2$ (Silane, chloro[4-(dimethylsilyl)phenyl]dimethyl-)	17873-29-9	**	8.6 ± 0.2	EI	4121
$CH_3SiCl_2^+$	CH_3SiHCl_2	20156-50-7	**	11.47	S	5183
$C_2H_6SiCl_2^+$	$(CH_3)_2SiCl_2$	75-78-5	**	10.99 (V)	PE	3503
$C_3H_6SiCl_2^+$	$C_3H_6SiCl_2$ (Silacyclobutane, 1,1-dichloro-)	2351-33-9	**	10.50 (V)	PE	4077
$C_4H_6SiCl_2^+$	$C_4H_6SiCl_2$ (Silacyclopent-3-ene, 1,1-dichloro-)	XXXXX-XX-X	**	9.63 (V)	PE	4517
$C_8H_{18}Si_2Cl_2^+$	$C_8H_{18}Si_2Cl_2$	65411-94-1	**	8.96 (V)	PE	4715
$C_9H_{14}Si_2Cl_2^+$	$C_6H_4(SiCl_2CH_3)SiH(CH_3)_2$ (Silane, 1,1-dichloro[3-(dimethylsilyl)phenyl]methyl-)	34259-71-7	**	8.6 ± 0.2	EI	4121
$C_3H_5SiCl_3^+$	$C_3H_5(SiCl_3)$ (Silane, 5-trichloro-2,4-cyclopentadien-1-yl-)	13688-63-6	**	9.0 (V)	PE	4373
$C_8H_{11}Si_2Cl_3^+$	$C_6H_4(SiCl_3)SiH(CH_3)_2$ (Silane, trichloro[3-(dimethylsilyl)phenyl]-)	34259-72-8	**	9.1 ± 0.2	EI	4121
	$C_6H_4(SiCl_3)SiH(CH_3)_2$ (Silane, trichloro[4-(dimethylsilyl)phenyl]-)	XXXXX-XX-X	**	9.3 ± 0.2	EI	4121
$C_6H_{12}Si_4Cl^+$	$C_6H_{12}Si_4Cl_4$ (1,3,5,7-Tetrasilatricyclo[3.3.1.1 ^{3,7}]decane, 1,3,5,7-tetrachloro-)	18222-89-4	**	9.4 ± 0.05	PE	3855
$C_4H_{12}N_2SiCl_2^+$	$((CH_3)_2N)_2SiCl_2$	13328-30-8	**	8.81 (V)	PE	3503
$C_2H_6NSiCl_3^+$	$((CH_3)_2N)SiCl_3$	13307-04-5	**	9.30 (V)	PE	3503
$C_9H_{13}OSiCl^+$	$ClC_6H_4Si(CH_3)_2OCH_3$ (Silane, (3-chlorophenyl)methoxydimethyl-)	62244-45-5	**	9.20	EI	5421
	$ClC_6H_4Si(CH_3)_2OCH_3$ (Silane, (4-chlorophenyl)methoxydimethyl-)	62244-44-4	**	9.20	EI	5421
$C_6H_{15}O_3SiCl^+$	$(C_2H_5O)_3SiCl$	4667-99-6	**	10.52 (V)	PE	3503
$C_7H_{10}O_2SiCl_2^+$	$(C_2H_5O)_2SiCl_2$	4667-38-3	**	10.78 (V)	PE	3503
$C_2H_3OSiCl_3^+$	$(C_2H_5O)SiCl_3$	1825-82-7	**	11.30 (V)	PE	3503

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
F_3SiCl^+	SiF_3Cl	14049-36-6	**	13.44 ± 0.02 (V)	PE	4026
$\text{C}_7\text{H}_7\text{FSiCl}^+$	$\text{ClC}_6\text{H}_4\text{Si}(\text{CH}_3)_2\text{F}$ (Silane,(3-chlorophenyl)fluorodimethyl-)	62244-52-4	CH_3	11.13	EI	5366
	$\text{ClC}_6\text{H}_4\text{Si}(\text{CH}_3)_2\text{F}$ (Silane,(4-chlorophenyl)fluorodimethyl-)	62244-51-3	CH_3	11.00	EI	5366
$\text{C}_8\text{H}_{10}\text{FSiCl}^+$	$\text{ClC}_6\text{H}_4\text{Si}(\text{CH}_3)_2\text{F}$ (Silane,(3-chlorophenyl)fluorodimethyl-)	62244-52-4	**	9.09	EI	5421
	$\text{ClC}_6\text{H}_4\text{Si}(\text{CH}_3)_2\text{F}$ (Silane,(4-chlorophenyl)fluorodimethyl-)	62244-51-3	**	9.15	EI	5421
PCl^+	PCl_1	7719-12-2		16.0 ± 0.2	EI	3556
PCl_2^+	PCl_1	7719-12-2	Cl	11.9 ± 0.1	EI	3556
	PCl_2Br	13536-48-6	Br	11.3 ± 0.1	EI	3556
PCl_3^+	PCl_1	7719-12-2	**	10.5 (V)	PE	5190
			**	10.51 (V)	PE	4023
			**	10.52 ± 0.03 (V)	PE	3669
			**	10.52 (V)	PE	4146
			**	10.54 (V)	PE	5539
			**	10.5 ± 0.1	EI	3556
PCl_5^+	PCl_5	10026-13-8	**	10.7 (V)	PE	5190
			**	10.88 (V)	PE	3669
CPCl_5^+	CCl_3PCl_2	3582-11-4	**	10.25 (V)	PE	4474
$\text{C}_2\text{H}_6\text{PCl}^+$	$(\text{CH}_3)_2\text{PCl}$	811-62-1	**	9.20 (V)	PE	4474
$\text{C}_6\text{H}_{10}\text{PCl}^+$	$(\text{tert-C}_4\text{H}_9)_2\text{PCl}$	13716-10-4	**	8.45 (V)	PE	4474
$\text{C}_{18}\text{H}_{26}\text{PCl}^+$	$\text{ClC}_6\text{H}_4\text{P}(\text{C}_6\text{H}_{11})_2$ (Phosphine, (4-chlorophenyl)dicyclohexyl-)	40438-62-8	**	8.14 (V)	PE	5417
$\text{C}_{15}\text{H}_{31}\text{PCl}^+$	$\text{C}_{15}\text{H}_{31}\text{PCl}$ (Cyclopenta-1,3-diene,1,4-diphenyl-5-triphenylphosphinylium- 2,3-(naphtha-1,8-diyl),chloride)	XXXXXX-XX-X	**	6.82	CTS	5593
$\text{CH}_3\text{PCl}_2^+$	CH_3PCl_2	676-83-5	**	9.85 (V)	PE	4474
$\text{C}_2\text{H}_5\text{PCl}_2^+$	$\text{C}_2\text{H}_5\text{PCl}_2$	1498-40-4	**	9.70 ± 0.05 (V)	PE	5033
$\text{C}_1\text{H}_9\text{PCl}_2^+$	$\text{tert-C}_4\text{H}_9\text{PCl}_2$	25979-07-1	**	9.30 (V)	PE	4474

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_6H_5PCl_2^+$	$C_6H_5PCl_2$ (Phosphonous dichloride, phenyl-)	644-97-3	**	9.7 (V)	PE	5190
			**	9.10±0.01	PE	4154
$C_{23}H_{17}PCl_2^+$	$C_5H_3P(C_6H_5)_3Cl_2$ (Phosphorin, 1,1-dichloro-1,1-dihydro-2,4,6-triphenyl-)	40425-71-6	**	7.05 (V)	PE	5271
$CH_2PCl_3^+$	$(CH_2Cl)PCl_2$	2155-78-4	**	9.58	PE	5627
$C_2H_4PCl_3^+$	$(CH_2Cl)_2PCl$	22402-95-5	**	9.38	PE	5627
$C_{18}H_{12}PCl_3^+$	$(ClC_6H_4)_3P$ (Phosphine, tris(4-chlorophenyl)-)	1159-54-2	**	8.18 (V)	PE	5438
$N_3P_3Cl_6^+$	$N_3P_3Cl_6$	940-71-6	**	10.43	PE	5295
$C_4H_{12}N_2PCl^+$	$((CH_3)_2N)_2PCl$	3348-44-5	**	8.25 (V)	PE	4474
$C_2H_6NPCl_2^+$	$(CH_3)_2NPCl_2$	683-85-2	**	9.45 (V)	PE	4261
			**	9.50 (V)	PE	4474
$OPCl^+$	$POCl$	21295-50-1	**	11.85 (V)	PE	4023
			**	12.35 (V)	PE	4023
			**	12.93 (V)	PE	4023
			**	12.98 (V)	PE	4023
			**	13.48 (V)	PE	4023
			**	13.85 (V)	PE	4023
			**	15.37 (V)	PE	4023
			**	16.53 (V)	PE	4023
$OPCl_3^+$	$POCl_3$	10025-87-3	**	11.36±0.02	PE	3835
			**	11.49 (V)	PE	5624
			**	11.58±0.05	PE	3641
			**	11.89±0.03 (V)	PE	3669
			**	12.0 (V)	PE	5190
	$POCl_3$	63736-95-8	**	11.89±0.02 (V)	PE	4730
$C_2H_6OPCl^+$	$(CH_3)_2P(O)Cl$	1111-92-8	**	10.77 (V)	PE	5523
$C_4H_8OPCl^+$	$POCl(C_2H_5)(CH=CH_2)$	61752-99-6	**	10.62 (V)	PE	5021
$C_4H_{10}O_3PCl^+$	$OPCl(OC_2H_5)_2$	814-49-3	**	10.29	PE	5627
$C_6H_{14}O_3PCl^+$	$OPCl(OC_3H_7)_2$	2510-89-6	**	10.89	PE	5627
$CH_3OPCl_2^+$	CH_3OPCl_2	676-97-1	**	10.92	PE	5627
			**	11.4 (V)	PE	5190

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
CH₃OPCl₂⁺	CH ₃ OPCl ₂	676-97-1	**	11.43 (V)	PE	5523
			**	11.45 (V)	PE	5021
			**	11.49 (V)	PE	5328
C₂H₃OPCl₂⁺	POCl ₂ (CH=CH ₂)	1438-74-0	**	10.81	PE	5032
			**	11.24 (V)	PE	5021
			**	11.24 (V)	PE	5328
C₃H₅OPCl₂⁺	POCl ₂ (CH ₂ CH=CH ₂)	1498-47-1	**	10.54 (V)	PE	5021
	POCl ₂ (C(CH ₃)=CH ₂)	3944-27-2	**	10.86 (V)	PE	5021
C₆H₅OPCl₂⁺	C ₆ H ₅ (POCl ₂) (Phosphonic dichloride, phenyl-)	824-72-6	**	9.95 (V)	PE	5021
CH₃O₂PCl₂⁺	PCl ₂ O(OCH ₃)	677-24-7	**	11.50 (V)	PE	4699
C₂H₅O₂PCl₂⁺	PCl ₂ O(OC ₂ H ₅)	1498-51-7	**	11.42 (V)	PE	4699
			**	11.46 (V)	PE	5624
C₄H₉O₂PCl₂⁺	(CH ₂ Cl) ₂ (OC ₂ H ₅)PO	13274-84-5	**	10.19	PE	5627
C₆H₅O₂PCl₂⁺	OPCl ₂ OC ₆ H ₅ (Phosphorodichloridic acid, phenyl ester)	770-12-7	**	9.1	PE	5627
C₄H₇O₄PCl₂⁺	(CH ₃ O) ₂ P(=O)OCHCCl ₂	62-73-7	**	9.4 (V)	PE	5190
C₂H₄OPCl₃⁺	(CH ₂ Cl) ₂ PClO	13482-64-9	**	10.46	PE	5627
C₈H₁₄O₅PCl₃⁺	(CH ₃ O) ₂ P(=O)CH(CCl ₃)OCOC ₄ H ₇	XXXXX-XX-X	**	10.3 (V)	PE	5190
C₄H₁₂N₂OPCl⁺	OPCl(N(CH ₃) ₂) ₂	1605-65-8	**	8.61	PE	5627
C₂H₆NOPCl₂⁺	(CH ₃) ₂ NPCl ₂ O	677-43-0	**	9.31 (V)	PE	5624
C₃H₆N₂OPCl₃⁺	CN ₂ P(=O)Cl ₃ (CH ₃) ₂	3576-20-3	**	9.20±0.1	EI	5462
	(1,3,2-Diazaphosphetidin-4-one, 2,2,2-trichloro-2,2-dihydro-1,3-dimethyl-)					
F₂PCl⁺	PF ₂ Cl	14335-40-1	**	12.8±0.1 (V)	PE	3662
C₂F₆PCl⁺	(CF ₃) ₂ PCl	650-52-2	**	11.13 (V)	PE	4371
			**	11.13 (V)	PE	4261
CF₃PCl₂⁺	CF ₃ PCl ₂	421-58-9	**	10.70 (V)	PE	4371
			**	10.70 (V)	PE	4261

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
CF₂PCl₃⁺	CCl ₃ PF ₂	1112-03-4	**	10.65 (V)	PE	4474
C₃H₆NF₃PCl⁺	(CH ₃) ₂ NP(Cl)CF ₃	3135-63-5	**	9.56 (V)	PE	4261
C₂H₆SiPCl⁺	Cl ₃ SiP(CH ₃) ₂	XXXXXX-XX-X	**	9.1±0.05 (V)	PE	5419
SCl⁺	SCl ₂	10545-99-0	Cl	12.2±0.1	EI	4287
S₂Cl⁺	S ₂ Cl ₂	10025-67-9	Cl	12.2±0.2	EI	4287
SCl₂⁺ (² B ₂) (² B ₁) (² A ₁ , ² B ₂) (² A ₂)	SCl ₂	10545-99-0	**	9.49	PE	4188
			**	9.67 (V)	PE	4150
			**	12.19 (V)	PE	4150
			**	12.45 (V)	PE	4150
			**	9.7±0.1	EI	4287
S₂Cl₂⁺	S ₂ Cl ₂	10025-67-9	**	9.4	PE	4188
			**	11.3±0.2	EI	4287
BSCl⁺ (² Π _{3/2})	ClB=S	55753-38-3	**	10.51±0.1	PE	4857
CSCl₂⁺	CCl ₂ S	463-71-8	**	9.61±0.02	PE	3667
			**	9.68	PE	4080
			**	9.80 (V)	PE	3746
C₂S₂Cl⁺	C ₂ S ₂ Cl ₄ (1,3-Dithietane,2,2,4,4-tetrachloro)	20464-23-7	**	9.69 (V)	PE	5572
C₂H₅SCl⁺	CH ₃ SCH ₂ Cl	2373-51-5	**	7.74 (V)	PE	5526
C₄H₃SCl⁺	C ₄ H ₃ SCl (Thiophene, 2-chloro-)	96-43-5	**	8.89±0.05 (V)	PE	4626
			**	9.06±0.05	EI	3482
			**	8.83	CTS	3787
C₅H₅SCl⁺	C ₄ H ₃ SCH ₂ Cl (Thiophene, 2-(chloromethyl)-)	765-50-4	**	8.89±0.05 (V)	PE	4626
C₁₂H₉SCl⁺	C ₆ H ₄ (Cl)SC ₆ H ₅ (Benzene, 1-chloro-3-(phenylthio)-)	38700-88-8	**	8.16	CTS	4272
	C ₆ H ₃ (Cl)SC ₆ H ₅ (Benzene, 1-chloro-4-(phenylthio)-)	13343-26-5	**	8.07	CTS	4272
C₉H₅S₃Cl⁺	(C ₃ HS ₂)=S(C ₆ H ₄ Cl)		**	8.15 (V)	PE	4403
	(3/2)g Ar ₂	5761-16-0	**	15.675±0.02 (V)	PE	4885

Ion	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_5H_8SCl_2^+$	$CCl_2=CHS(iso-C_3H_7)$	19284-67-4	**	8.14 ± 0.01	PI	5531
$C_{12}H_8SCl_2^+$	$C_6H_4(Cl)SC_6H_4Cl$ (Benzene, 1,1'-thiobis[4-chloro-])	5181-10-2	**	8.13	CTS	4272
$BC_{12}H_{18}SCl^+$	$C_6H_4(Cl)SB(n-C_3H_7)_2$ (Borinic acid, dipropylthio-3-chlorophenyl ester)	64541-68-0	**	8.87 ± 0.05 (V)	PE	4848
	$C_6H_4(Cl)SB(n-C_3H_7)_2$ (Borinic acid, dipropylthio-4-chlorophenyl ester)	64503-48-6	**	8.73 ± 0.05 (V)	PE	4848
$NSCl^+$	NSCl	17178-58-4	**	10.61 ± 0.01	PE	4604
$(^2A')$			**	10.96 (V)	PE	3660
			**	11.38 ± 0.02	PE	4604
$(^2A', ^2A'')$			**	11.80 (V)	PE	3660
$(^2A')$			**	13.73 ± 0.02	PE	4604
$(^2A')$			**	13.77 (V)	PE	3660
$(^2A')$			**	14.28 ± 0.02	PE	4604
$(^2A')$			**	14.46 (V)	PE	3660
$(^2A')$			**	16.5 ± 0.01	PE	4604
$C_8H_6NSCl^+$	$C_7H_5NS(Cl)CH_3$ (Benzothiazole, 6-chloro-2-methyl-)	4146-24-1	**	8.50 (V)	PE	4437
$C_8H_8NSCl^+$	$C_6H_4ClNHCSCH_3$ (Ethanethioamide, N-(2-chlorophenyl)-)	39184-83-3	**	8.10	EI	4834
$C_{12}H_{16}NSCl^+$	$C_6H_4ClNHCSCH_2C(CH_3)_3$ (Butanethioamide, N-(2-chlorophenyl)-3,3-dimethyl-)	62635-54-5	**	8.00 ± 0.05	EI	4834
$C_7H_7N_2SCl^+$	$C_6H_4ClNHCSNH_2$ (Thiourea, (2-chlorophenyl)-)	5344-82-1	**	8.05	EI	4834
$C_8H_9N_2SCl^+$	$C_6H_4ClNHCSNHCH_3$ (Thiourea, N-(2-chlorophenyl)-N'-methyl-)	30954-73-5	**	7.85 ± 0.05	EI	4834
$C_9H_{11}N_2SCl^+$	$C_6H_4ClNHCSNHC_2H_5$ (Thiourea, N-(2-chlorophenyl)-N'-ethyl-)	19384-08-8	**	7.85 ± 0.05	EI	4834
$C_{10}H_{13}N_2SCl^+$	$C_6H_4ClNHCSNHCH(CH_3)_2$ (Thiourea, N-(2-chlorophenyl)-N'-(1-methylethyl)-)	62635-49-8	**	7.80 ± 0.05	EI	4834
$C_{11}H_{15}N_2SCl^+$	$C_6H_4ClNHCSNHC(CH_3)_3$ (Thiourea, N-(2-chlorophenyl)-N'-(1,1-dimethylethyl)-)	62635-50-1	**	7.75 ± 0.05	EI	4834
$C_{17}H_{19}N_2SCl^+$	$C_{17}H_{19}N_2SCl$ (10H-Phenothiazine-10-propanamine, 2-chloro-N,N-dimethyl-)	50-53-3	**	7.16 ± 0.08 (V)	PE	4667
	$C_{17}H_{19}N_2SCl$ (10H-Phenothiazine-10-propanamine, 2-chloro-N,N-dimethyl-)	50-53-3	**	8.25 ± 0.07	CTS	4079

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_5H_2N_3SCl^+$	$C_5H_2N_3SCl$ ([1,2,3]Thiadiazolo[5,4- <i>b</i>]pyridine, 5-chloro-)	54459-89-1	**	9.57 ± 0.05	EI	4316
$C_{20}H_{21}N_3SCl^+$	$C_{12}H_7NS(Cl)(CH_2)_3C_6H_4N_2CH_3$ (10 <i>H</i> -Phenothiazine, 2-chloro-10-[3-(4-methyl-1-piperazinyl)propyl]-)	58-38-8	**	7.03 ± 0.07	CTS	4079
O_2SCl^+	SO_2Cl_2	7791-25-5	**	11.8 ± 0.5	EI	4921
$OSCl_2^+$	Cl_2SO	7719-09-7	**	11.07 (V)	PE	4295
			**	11.12 (V)	PE	3705
			**	11.13 (V)	PE	3646
			**	11.3 (V)	PE	3694
			**	11.3 (V)	PE	3879
$O_2SCl_2^+$	SO_2Cl_2	7791-25-5	**	12.05	PE	3879
			**	12.4 (V)	PE	3694
			**	12.41 (V)	PE	4827
			**	12.41 (V)	PE	5207
			**	12.42 (V)	PE	3705
			**	11.4 ± 0.5	EI	4921
$OSCl_3^+$	$SOCl_3$	XXXXXX-XX-X	**	9.63 ± 0.02	PE	3835
$C_{13}H_{11}OSCl^+$	$C_6H_4(OCH_3)SC_6H_4Cl$ (Benzene, 1-chloro-4-[(4-methoxyphenyl)thio]-)	20912-69-0	**	7.91	CTS	4272
$CH_3O_2SCl^+$	$(CH_3)SO_2(Cl)$	124-63-0	**	11.6 (V)	PE	4827
			**	11.6 (V)	PE	5207
			**	11.74 (V)	PE	3705
$C_{17}H_{17}N_2OSCl^+$	$C_{12}H_7NS(Cl)COCH_2CH_2N(CH_3)_2$ (10 <i>H</i> -Phenothiazine, 2-chloro-10-[3-(dimethylamino)-1-oxopropyl]-)	3576-45-2	**	8.24 ± 0.07	CTS	4079
$C_{19}H_{21}N_2OSCl^+$	$C_{12}H_7NS(Cl)COCH_2CH_2N(C_2H_5)_2$ (10 <i>H</i> -Phenothiazine, 2-chloro-10-[3-(diethylamino)-1-oxopropyl]-)	800-22-6	**	7.87 ± 0.07	CTS	4079
$C_{21}H_{26}N_3OSCl^+$	$C_{21}H_{26}N_3OSCl$ (1-Piperazineethanol, 4-[3-(2-chloro-10 <i>H</i> -phenothiazin-10-yl)propyl]-)	58-39-9	**	8.63 ± 0.07	CTS	4079
F_5SCl^+	SF_5Cl	13780-57-9	**	12.335 ± 0.005	PE	3655
$CFSCl^+$	$FCICS$	1495-18-7	**	10.20 (V)	PE	3746
$C_2F_3S_2Cl^+$	$S=C(Cl)SCF_3$	1540-66-5	**	9.57 (V)	PE	4345
O_2SFCl^+	SO_2FCl	13637-84-8	**	12.61 (V)	PE	3705
			**	12.3 ± 0.5	EI	4921

Ion	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₆H₁₁SiSCl⁺	C ₆ H ₅ SSi(CH ₃) ₂ Cl (Silane, chlorodimethyl(phenylthio)-)	52548-11-5	**	8.76±0.1	EI	4198
C₆H₅SiSCl⁺	C ₆ H ₅ SSiCl ₃ (Silane, trichloro(phenylthio)-)	7579-91-1	**	9.03±0.1	EI	4198
PSCl₃⁺	PSCl ₃	3982-91-0	**	9.71±0.003	PE	4086
			**	9.71±0.03	PE	4279
			**	10.11 (V)	PE	4023
			**	10.13±0.03 (V)	PE	3669
			**	10.15 (V)	PE	5514
			**	10.15 (V)	PE	5627
C₂H₆PSCl⁺	(CH ₃) ₂ P(S)Cl	993-12-4	**	9.12 (V)	PE	5523
CH₃PSCl₂⁺	CH ₃ P(S)Cl ₂	676-98-2	**	9.73 (V)	PE	5523
C₆H₅PSCl₂⁺	C ₆ H ₅ P(Cl) ₂ S (Phosphonothioic dichloride, phenyl-)	3497-00-5	**	9.02±0.03	PE	4279
			**	9.02	PE	5514
			**	9.47 (V)	PE	5627
C₂H₄PSCl₃⁺	(CH ₂ Cl) ₂ PSCl	20459-66-9	**	9.16	PE	5627
C₄H₁₂N₂PSCl⁺	((CH ₃) ₂ N) ₂ ClPS	3732-81-8	**	8.23±0.003	PE	4086
			**	8.23±0.02	PE	4279
			**	8.75 (V)	PE	5627
C₂H₆NPSCl₂⁺	PSCl ₂ N(CH ₃) ₂	1498-65-3	**	8.97±0.003	PE	4086
			**	8.97±0.04	PE	4279
			**	9.35 (V)	PE	5627
C₄H₁₀O₂PSCl⁺	(C ₂ H ₅ O) ₂ ClPS	2524-04-1	**	8.83±0.02	PE	4279
			**	9.41 (V)	PE	5514
			**	9.41 (V)	PE	5627
CH₃OPSCl₂⁺	PCl ₂ S(OCH ₃)	2523-94-6	**	9.85 (V)	PE	4699
	Cl ₂ P(O)SCH ₃	18281-76-0	**	10.20 (V)	PE	5328
C₂H₅OPSCl₂⁺	SPCl ₂ (OC ₂ H ₅)	1498-64-2	**	9.81 (V)	PE	5627
			**	9.32±0.03	PE	4279
			**	9.81 (V)	PE	5514
Ar⁺	Ar	7440-37-1	**	15.75973±0.00001 S		3923
			**	15.753±0.002	PE	3525
			**	15.930±0.002	PE	3525
			**	15.713±0.003	PEN	3541
			**	15.7	EI	5022

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
Ar^{+2}	Ar	7440-37-1	**	~43	EI	3445
			**	43.5 ± 0.2	EI	4503
			**	43.7 ± 0.5	EI	3625
	Ar^+	XXXXX-XX-X	**	~17	EI	5022
Ar_2^+	Ar_2	12595-59-4	**	14.44	PI	5195
			**	14.54 ± 0.02	PI	4923
			**	15.55 ± 0.025 (V)	PE	4885
			**	15.675 ± 0.02 (V)	PE	4885
			**	15.87 ± 0.015 (V)	PE	4885
			**	15.99 ± 0.03 (V)	PE	4885
			**	15.2 ± 0.2	EI	5350
			**	15.675 ± 0.02 (V)	PE	4885
K^+	K	7440-09-7	**	4.34	PE	4642
			**	4.1 ± 0.3	EI	4873
			**	4.4	EI	4912
	$(^3\text{P}_{3/2})$	7681-11-0	I^-	25.14 ± 0.04 (V)	PE	5035
	$(^3\text{P}_{1/2})$			25.50 ± 0.04 (s)	PE	5035
	KF	7789-23-3	F	9.54 ± 0.20	EI	4663
	K_2	25681-80-5	K	4.85	PI	4914
	$(^3\text{P}_{3/2})$	7447-40-7	Cl^-	24.98 ± 0.04 (V)	PE	5035
	$(^3\text{P}_{1/2})$			25.22 ± 0.04 (s)	PE	5035
	$(^3\text{P}_{3/2})$	7758-02-3	Br^-	25.04 ± 0.04 (V)	PE	5035
	$(^3\text{P}_{1/2})$			25.36 ± 0.04 (s)	PE	5035
	KBO_2	XXXXX-XX-X	BO_2	9.47 ± 0.20	EI	4663
	NaK	12056-29-0	Na	4.96	PI	4914
K_2^+	K_2	25681-80-5	**	4.059 ± 0.001	PI	4914
			**	4.06073 ± 0.00016	PI	1395
	$(^3\Sigma_g^+)$		**	3.9	EI	4912
K_3^+	K_3	37279-39-3	**	3.3 ± 0.1	PI	4914
K_4^+	K_4	39297-76-2	**	3.6 ± 0.1	PI	4914
K_5^+	K_5	39297-77-3	**	3.3 ± 0.1	PI	4914
K_7^+	K_7	39297-79-5	**	3.3 ± 0.1	PI	4914
K_8^+	K_8	39297-80-8	**	3.4 ± 0.1	PI	4914

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
LiK⁺	KLi	12030-83-0	**	4.69±0.10	EI	4912
CNK⁺	KCN	151-50-8	**	9.3±0.3	EI	4875
CNK₂⁺	(KCN) ₂	XXXXXX-XX-X		10.3±0.3	EI	4875
C₂N₂K₃⁺	(KCN) ₃	XXXXXX-XX-X		10. ±1	EI	4875
OK⁺	KO	12401-70-6	**	7.1±0.2	EI	4745
			**	8. ±1	EI	4745
OK₂⁺	K ₂ O	12136-45-7	**	7.5±0.1	EI	4745
			**	7.5±0.2	EI	4745
			**	10.7±0.3	EI	4873
BO₂K⁺	KBO ₂	XXXXXX-XX-X	**	8.62±0.14	EI	4663
BO₂K₂⁺	(KBO ₂) ₂	XXXXXX-XX-X BO ₂		9.97±0.18	EI	4663
	K ₂ BO ₂ F	XXXXXX-XX-X F ⁻		5.91±0.10	EI	4663
	K ₂ BO ₂ F	XXXXXX-XX-X F		9.97±0.18	EI	4663
CO₃K₂⁺	K ₂ CO ₃	XXXXXX-XX-X	**	7.4±0.3	EI	4873
NO₃K⁺	KNO ₃	XXXXXX-XX-X	**	8.96±0.03 (V)	PE	5354
FK₂⁺	K ₂ F ₂	12285-62-0	F ⁻	5.48±0.12	EI	4663
			F	9.44±0.15	EI	4663
	K ₂ BO ₂ F	XXXXXX-XX-X BO ₂ ⁻		5.48±0.12	EI	4663
	K ₂ BO ₂ F	XXXXXX-XX-X BO ₂		9.44±0.15	EI	4663
NaK⁺	NaK	12056-29-0	**	4.52±0.05	PI	4914
			**	4.57±0.20	EI	4912
NaK₂⁺	NaK ₂	12532-69-3	**	3.6±0.1	PI	4914
Na₂K⁺	Na ₂ K	12286-02-1	**	3.7±0.1	PI	4914
Na₂K₂⁺	Na ₂ K ₂	66459-14-1	**	4.0±0.1	PI	4914
Na₃K⁺	Na ₃ K	66419-70-3	**	4.1±0.05	PI	4914
Na₄K⁺	Na ₄ K	66419-71-4	**	4.0±0.1	PI	4914

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
Na_5K^+	Na_5K	66419-72-5	**	4.1 ± 0.1	PI	4914
F_4AlK^+	KAlF_4	14484-69-6	**	13.02 ± 0.05 (V)	PE	5238
O_3PK^+	KPO_3	XXXXX-XX-X	**	9.44 ± 0.03 (V)	PE	4840
ClK^+	KCl	7447-40-7	**	8.44 ± 0.1	PE	4344
$(^2\text{P}_{3/2})$			**	8.44 ± 0.1	PE	5035
$(^2\text{P}_{3/2})$			**	8.7 (V)	PE	4307
Cl_2K_2^+	$(\text{KCl})_2$	12258-97-8	**	9.60 (V)	PE	4344
			**	9.60 (V)	PE	5035
AlCl_4K^+	KAlCl_4	13821-13-1	**	10.96 ± 0.05 (V)	PE	5238
Ca^+	Ca	7440-70-2	**	6.11321 ± 0.00002 S		4583
$(^2\text{S}_{1/2})$			**	6.0	PE	4860
			**	6.0 ± 0.3	EI	5067
			**	6.06 ± 0.05	EI	4114
			**	6.08 ± 0.06	EI	5342
			**	~ 6.1	EI	3486
Ca^{+2}	Ca	7440-70-2	**	18	EI	3486
HCa^+	CaH	14452-75-6	**	5.86 ± 0.09	S	4216
OCa^+	CaO	1305-78-8	**	6.5 ± 1	EI	4881
Cl_2Ca^+	CaCl_2	10043-52-4	**	10.2 (V)	PE	4761
Sc^+	Sc	7440-20-2	**	6.7 ± 0.5	EI	5349
C_2Sc^+	ScC_2	XXXXX-XX-X	**	7.6 ± 0.5	EI	5349
	ScC_2	12175-91-6	**	7.7 ± 0.2	EI	3470
$\text{C}_{15}\text{H}_3\text{O}_6\text{F}_{18}\text{Sc}^+$	$(\text{CF}_3\text{COCHCOCF}_3)_3\text{Sc}$	18990-42-6	**	10.13 ± 0.07 (V)	PE	3682
	(Scandium, tris(1,1,1,5,5,5-hexafluoro-2,4-pentanedionato- <i>O,O'</i>)-, (<i>OC</i> -6-11)-)					
Ti^+	Ti	7440-32-6	**	6.6 ± 0.5	EI	3449
			**	6.7	EI	4872
			**	6.78 ± 0.02	EI	5342
			**	6.8 ± 0.1	EI	4114
			**	7.3 ± 0.6	EI	4206
			**	7.3 ± 0.6	EI	5635
			**	7.4 ± 0.5	EI	3594
	TiO	12137-20-1	O	14.5 ± 0.7	EI	3594
				14.51 ± 0.36	EI	4103

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₂Ti⁺	TiC ₂	12071-32-8	**	8.2±0.6	EI	4206
			**	8.2±0.6	EI	5635
			**	8.7±0.5	EI	4112
C₁Ti⁺	TiC ₁	12547-96-5	**	9.0±1.0	EI	4112
C₁₂H₁₂Ti⁺	C ₇ H ₇ Ti(C ₅ H ₅) (Titanium, (η ⁷ -cycloheptatrienylium)(η ⁵ -2,4-cyclopentadien-1-yl)-)	51203-49-7	**	6.83±0.05 (V)	PE	4132
			**	5.5-6.0 (V)	PE	4393
C₁₃H₁₃Ti⁺	C ₈ H ₈ Ti(C ₅ H ₅) (Titanium, (η ⁸ -1,3,5,7-cyclooctatetraene)(η ⁵ -2,4-cyclopentadien-1-yl)-)	11065-40-0	**	5.67±0.05 (V)	PE	4132
C₁₄H₁₆Ti⁺	(C ₆ H ₅ CH ₃) ₂ Ti (Titanium, bis[(1,2,3,4,5,6-η)-methylbenzene]-)	55527-82-7	**	5.4-7.2 (V)	PE	4393
C₂₀H₁₄Ti⁺	((CH ₃) ₃ CCH ₂) ₄ Ti	36945-13-8	**	8.33±0.1 (V)	PE	4242
C₁₃H₃₃N₃Ti⁺	(N(C ₂ H ₅) ₂) ₃ (CH ₃)Ti	25483-56-1	**	7.6 (V)	PE	4734
C₈H₂₄N₄Ti⁺	(N(CH ₃) ₂) ₄ Ti	XXXXXX-XX-X	**	7.13 (V)	PE	4588
C₁₆H₄₀N₄Ti⁺	(N(C ₂ H ₅) ₂) ₄ Ti	XXXXXX-XX-X	**	6.83 (V)	PE	4588
OTi⁺	TiO	12137-20-1	**	6.4±0.1	EI	4114
			**	6.7±0.1	EI	5471
			**	6.7	EI	4872
			**	6.8±0.5	EI	3449
			**	6.8±0.5	EI	4678
			**	7.22±0.35	EI	4103
			**	7.3±0.5	EI	3594
O₂Ti⁺	TiO ₂	13463-67-7	**	8.5±0.5	EI	3594
			**	9.54±0.1	EI	5471
			**	10.2±0.2	EI	4114
			**	11.56±0.14	EI	4103
C₁₂H₁₀O₂Ti⁺	(C ₅ H ₅) ₂ (CO) ₂ Ti (Titanium, dicarbonylbis(η ⁵ -2,4-cyclopentadien-1-yl)-)	12129-51-0	**	6.35 (V)	PE	5217
C₁₀H₂₄O₃Ti⁺	(n-C ₃ H ₇ O) ₃ (CH ₃)Ti	64516-16-1	**	9.4 (V)	PE	4734
C₁₀H₂₄O₄Ti⁺	(n-C ₃ H ₇ O) ₃ (CH ₃ O)Ti	64516-17-2	**	9.1 (V)	PE	4734
N₄O₁₂Ti⁺	(NO ₂) ₄ Ti	12372-56-4	**	12.35±0.11 (V)	PE	4999

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{10}H_{10}F_2Ti^+$	$(\eta-C_5H_5)_2TiF_2$ (Titanium, bis(η^5 -2,4-cyclopentadien-1-yl)difluoro-)	309-89-7	**	8.1 ± 0.1 (V)	PE	4987
$C_{15}H_3O_6F_{18}Ti^+$	$(CF_3COCHCOCF_3)_3Ti$ (Titanium, tris(1,1,1,5,5,5-hexafluoro-2,4-pentanedionato- <i>O,O'</i>)-, (<i>OC</i> -6-11)-)	22854-59-7	**	7.94 ± 0.07 (V)	PE	3682
			**	7.98 (V)	PE	3681
$C_{16}H_{44}Si_4Ti^+$	$((CH_3)_3SiCH_2)_4Ti$	33948-28-6	**	8.58 ± 0.1 (V)	PE	4242
STi^+	TiS	12039-07-5	**	7.1 ± 0.3	EI	3449
$ClTi^+$	TiCl ₄	7550-45-0	**	11.70 (V)	PE	5148
			**	11.76 (V)	PE	4694
$C_{10}H_{10}Cl_2Ti^+$	$(\eta-C_5H_5)_2TiCl_2$ (Titanium dichlorobis(η^5 -2,4-cyclopentadien-1-yl)-)	1271-19-8	**	8.5 ± 0.1 (V)	PE	4987
		1271-19-8	**	8.46 ± 0.05 (V)	PE	4375
	Titanium, dichlorobis (η^5 -2,4-cyclopentadien-1-yl)-)					
$CH_3Cl_3Ti^+$	Ti(CH ₃)Cl ₃	2747-38-8	**	10.8 (V)	PE	4734
V^+	V	7440-62-2	**	~ 7.5	EI	4202
			**	7 ± 1	EI	3801
	VOF ₃	13709-31-4	3F + O	31.26 ± 0.19	EI	4546
	VOCl ₃	7727-18-6	3Cl + O	26.83 ± 0.39	EI	4546
V^{+5}	V^{+4}	22541-76-0	**	65.2812 ± 0.0006	S	4264
$C_{10}H_{10}V^+$	$(C_5H_5)_2V$ (Vanadocene)	1277-47-0	**	6.78 (V)	PE	5507
			**	6.81 (V)	PE	5394
$C_{12}H_{12}V^+$	$C_7H_7V(C_5H_5)$ (Vanadium, (η^7 -cycloheptatrienylium)(η^5 -2,4-cyclopentadien-1-yl)-)	12636-68-9	**	6.42 ± 0.05 (V)	PE	4132
$C_{12}H_{14}V^+$	$(C_5H_4CH_3)_2V$ (Vanadocene, 1,1'-dimethyl-)	12146-93-9	**	6.60 (V)	PE	5507
$C_{18}H_{24}V^+$	$(C_6H_4(CH_3)_2)_2V$ (Vanadium, bis[(1,2,3,4,5,6- η)-1,3,5-trimethylbenzene]-)	1272-71-5	**	5.61 ± 0.05 (V)	PE	4132
$C_{20}H_{30}V^+$	$(C_5(CH_3)_2)_2V$ (Vanadocene, decamethyl-)	XXXXX-XX-X	**	5.87 (V)	PE	5394
NV^+	VN	24646-85-3	**	8 ± 1	EI	3801

Ion	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
(state)						
$\text{C}_6\text{H}_{24}\text{N}_1\text{V}^+$	$(\text{N}(\text{CH}_3)_2)_4\text{V}$	XXXXX-XX-X **		6.2 (V)	PE	4588
OV^+	VO	12035-98-2	**	8 ± 1	EI	3620
	VOF_3	13709-31-4	3F	24.41 ± 0.10	EI	4546
	VOCl_3	7727-18-6	3Cl	19.77 ± 0.09	EI	4546
O_2V^+	VO_2	12036-21-4	**	12.7 ± 0.2	EI	4131
			**	10 ± 2	EI	3620
O_8V_4^+	V_4O_8	12503-87-6	**	13 ± 1	EI	3620
$\text{O}_{10}\text{V}_4^+$	V_4O_{10}	12503-98-9	**	11.8 ± 0.3	EI	4131
			**	12 ± 1	EI	3620
$\text{N}_3\text{O}_{10}\text{V}^+$	$(\text{NO}_3)_3\text{VO}$	16017-37-1	**	12.33 ± 0.04 (V)	PE	4999
FV^+	VOF_3	13709-31-4	2F+O	25.75 ± 0.26	EI	4546
F_2V^+	VOF_3	13709-31-4	F+O	20.83 ± 0.19	EI	4546
F_3V^+	VOF_3	13709-31-4	O	16.76 ± 0.05	EI	4546
OFV^+	VOF_3	13709-31-4	2F	19.92 ± 0.06	EI	4546
OF_2V^+	VOF_3	13709-31-4	F	15.31 ± 0.06	EI	4546
OF_3V^+	VOF_3	13709-31-4	**	13.88 ± 0.05	EI	4546
$\text{C}_{15}\text{H}_3\text{O}_6\text{F}_{18}\text{V}^+$	$(\text{CF}_3\text{COCHCOCF}_3)_3\text{V}$	15695-77-9	**	8.68 ± 0.07 (V)	PE	3682
	(Vanadium, tris(1,1,1,5,5,5-hexafluoro-2,4-pentanedionato- <i>O,O'</i>)-, (<i>OC</i> -6-11)-)		**	8.68 (V)	PE	3681
SV^+	VS	12166-27-7	**	~ 9	EI	4202
ClV^+	VOCl_3	7727-18-6	2Cl+O	22.16 ± 0.07	EI	4546
Cl_2V^+	VOCl_3	7727-18-6	Cl+O	18.98 ± 0.20	EI	4546
Cl_3V^+	VOCl_3	7727-18-6	O	16.48 ± 0.28	EI	4546
OCIV^+	VOCl_3	7727-18-6	Cl_2	14.05 ± 0.06	EI	4546
			2Cl	16.31 ± 0.05	EI	4546

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
OCl₂V⁺	VOCl ₃	7727-18-6	Cl	13.25±0.05	EI	4546
OCl₃V⁺	VOCl ₃	7727-18-6	** **	11.84 (V) 11.90±0.05	PE EI	5148 4546
Cr⁺ (⁶ S) (⁶ D)	Cr	7440-47-3	** ** **	6.76 8.29 6.76 (V)	PE PE OTH	4858 4858 5286
	(CO) ₆ Cr	13007-92-6	6CO	15.36±0.03	EI	5291
	(C ₆ H ₅ (CO) ₃)Cr	12082-08-5	C ₆ H ₅ +3CO	12.2±0.2	EI	3786
	(Chromium, (η ⁶ -benzene)tricarbonyl-)					
	(C ₇ H ₈ (CO) ₃)Cr	12125-72-3	C ₆ H ₆ +3CO C ₇ H ₈ +3CO	13.50±0.1 13.3±0.2	EI EI	3788 5210
	(Chromium, tricarbonyl[(1,2,3,4,5,6-η)-1,3,5-cycloheptatriene]-)					
	(C ₆ H ₅ CH ₃ (CO) ₃)Cr	12083-24-8	C ₆ H ₅ CH ₃ +3CO	13.42±0.1	EI	3788
	(Chromium, tricarbonyl[(1,2,3,4,5,6-η)-methylbenzene]-)					
			C ₆ H ₅ CH ₃ +3CO	13.5±0.2	EI	5210
	(C ₆ H ₃ (CH ₃) ₂ (CO) ₃)Cr	12129-29-2		13.06±0.1	EI	3788
	(Chromium, tricarbonyl[(1,2,3,4,5,6-η)-1,2-dimethylbenzene]-)					
	(C ₆ H ₃ (CH ₃) ₃ (CO) ₃)Cr	12129-67-8		13.90±0.1	EI	3788
	(Chromium, tricarbonyl[(1,2,3,4,5,6-η)-1,3,5-trimethylbenzene]-)					
	(C ₆ (CH ₃) ₆ (CO) ₃)Cr	12088-11-8		13.00±0.1	EI	3788
	(Chromium, tricarbonyl[(1,2,3,4,5,6-η)-hexamethylbenzene]-)					
	(C ₆ H ₅ CH ₂ OH)(CO) ₃ Cr	12116-45-9		14.01±0.1	EI	3788
	(Chromium, [(1,2,3,4,5,6-η)-benzenemethanol]tricarbonyl-)					
	(C ₆ H ₅ OCH ₃ (CO) ₃)Cr	12116-44-8		12.65±0.1	EI	3788
	(Chromium, tricarbonyl[(1,2,3,4,5,6-η)-methoxybenzene]-)					
	(C ₆ H ₅ COOCH ₃ (CO) ₃)Cr	12125-87-0		14.00±0.1	EI	3788
	(Chromium, tricarbonyl[(1,2,3,4,5,6-η)-methylbenzoate]-)					
	(C ₆ H ₅ NH ₂ (CO) ₃)Cr	12108-11-1	C ₆ H ₅ NH ₂ +3CO	13.17±0.1	EI	3788
	(Chromium, (η ⁶ -benzenamine)tricarbonyl-)					
	((CH ₃) ₂ N) ₃ P(CO) ₃ Cr	XXXXX-XX-X		22.3±0.05	EI	3952
	((CH ₃) ₂ N) ₃ P ₂ (CO) ₃ Cr	19976-85-3		22.2±0.05	EI	3952
	CS(CO) ₅ Cr	50358-90-2	5CO+CS	16.16±0.07	EI	5291
	(C ₆ H ₅ Cl)(CO) ₃ Cr	12082-03-0	C ₆ H ₅ Cl+3CO	14.10±0.1	EI	3788
	(Chromium, tricarbonyl(η ⁶ -chlorobenzene)-)					
C₅H₅Cr⁺	(C ₅ H ₅ (CO) ₂ (NO)Cr	36312-04-6	2CO+NO	12.79±0.1	EI	5348
	(Chromium, dicarbonyl(η ⁵ -2,4-cyclopentadien-1-yl)nitrosyl-)					
	(C ₅ H ₅ (CO) ₂ (NS)Cr	66539-91-1	2CO+NS	13.45±0.1	EI	5348
	(Chromium, dicarbonyl(η ⁵ -2,4-cyclopentadien-1-yl)thionitrosyl-)					
C₆H₆Cr⁺	(C ₆ H ₆ (CO) ₃)Cr	12082-08-5	3CO	9.0±0.2	EI	3786
	(Chromium, (η ⁶ -benzene)tricarbonyl-)					
			3CO	10.34±0.1	EI	3788
C₇H₈Cr⁺	(C ₇ H ₈ (CO) ₃)Cr	12125-72-3	3CO	10.2±0.2	EI	5210
	(Chromium, tricarbonyl[(1,2,3,4,5,6-η)-1,3,5-cycloheptatriene]-)					
	(C ₆ H ₅ CH ₃ (CO) ₃)Cr	12083-24-8	3CO	10.04±0.1	EI	3788
	(Chromium, tricarbonyl[(1,2,3,4,5,6-η)-methylbenzene]-)					
			3CO	10.1±0.2	EI	5210
C₈H₁₀Cr⁺	(C ₈ H ₁₀ (CH ₃) ₂ (CO) ₃)Cr	12129-29-2	3CO	9.60±0.1	EI	3788
	(Chromium, tricarbonyl[(1,2,3,4,5,6-η)-1,2-dimethylbenzene]-)					

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_9H_{12}Cr^+$	$(C_9H_3(CH_3)_3)(CO)_3Cr$ (Chromium, tricarbonyl[(1,2,3,4,5,6- η)-1,3,5-trimethylbenzene]-)	12129-67-8	3CO	10.35 ± 0.1	EI	3788
$C_{10}H_{10}Cr^+$	$(C_7H_5)_2Cr$ (Chromocene)	1271-24-5	**	5.50	PE	3725
			**	5.70 (V)	PE	5394
			**	5.71 (V)	PE	5507
$C_{11}H_{11}Cr^+$	$C_6H_5Cr(C_5H_5)$ (Chromium, (η^6 -benzene)(η^5 -2,4-cyclopentadien-1-yl)-)	12093-16-2	**	7.15 ± 0.05 (V)	PE	4132
			**	6.20 ± 0.1 (V)	PE	3686
$C_{12}H_{12}Cr^+$	$C_7H_7Cr(C_5H_5)$ (Chromium, (η^7 -cycloheptatrienyl)(η^5 -2,4-cyclopentadien-1-yl)-)	12093-81-1	**	5.59 ± 0.05 (V)	PE	4132
	$(C_6H_5)_2Cr$ (Chromium, bis(benzene)-)	1271-54-1	**	5.4 ± 0.1 (V)	PE	3686
			**	5.45 ± 0.02 (V)	PE	4447
$C_{12}H_{11}Cr^+$	$(C_7H_7CH_3)_2Cr$ (Chromocene, 1,1'-dimethyl-)	12146-92-8	**	5.53 (V)	PE	5507
$C_{12}H_{18}Cr^+$	$(C_6(CH_3)_3)(CO)_3Cr$ (Chromium, tricarbonyl[(1,2,3,4,5,6- η)-hexamethylbenzene]-)	12088-11-8	3CO	9.82 ± 0.1	EI	3788
$C_{14}H_{16}Cr^+$	$(C_6H_5CH_3)_2Cr$ (Chromium, bis(η^6 -methyl benzene)-)	12087-58-0	**	5.24 ± 0.1 (V)	PE	3686
$C_{18}H_{24}Cr^+$	$(C_9H_3(CH_3)_3)_2Cr$ (Chromium, bis[(1,2,3,4,5,6- η)-1,3,5-trimethylbenzene]-)	1274-07-3	**	5.01 ± 0.05 (V)	PE	4132
$C_{20}H_{30}Cr^+$	$(C_5(CH_3)_5)_2Cr$ (Chromocene, decamethyl-)	XXXXXX-XX-X	**	4.93 (V)	PE	5394
$C_{20}H_{44}Cr^+$	$((CH_3)_3CCH_2)_4Cr$	37007-84-4	**	7.25 ± 0.1 (V)	PE	3830
$C_{24}H_{36}Cr^+$	$(C_6(CH_3)_5)_2Cr$ (Chromium, bis[(1,2,3,4,5,6- η)-hexamethylbenzene]-)	12243-39-9	**	4.68 (V)	PE	5286
$C_6H_7N^+Cr^+$	$(C_6H_5NH_2)(CO)_3Cr$ (Chromium, (η^6 -benzenamine)tricarbonyl-)	12108-11-1	3CO	9.96 ± 0.1	EI	3788
$C_{18}H_{42}N_3Cr^+$	$(N(iso-C_3H_7)_2)_3Cr$	XXXXXX-XX-X	**	6.3 (V)	PE	5036
$C_{16}H_{40}N_3Cr^+$	$(N(C_2H_5)_2)_4Cr$	XXXXXX-XX-X	**	5.9 (V)	PE	5036
$COCr^+$	$(CO)_6Cr$	13007-92-6	5CO	14.03 ± 0.04	EI	5291
	$CS(CO)_5Cr$	50358-90-2	4CO + CS	14.94 ± 0.08	EI	5291

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$\text{C}_2\text{O}_2\text{Cr}^+$	$(\text{CO})_6\text{Cr}$	13007-92-6	4CO	12.51 ± 0.04	EI	5291
	$\text{CS}(\text{CO})_5\text{Cr}$	50358-90-2	3CO + CS	13.52 ± 0.08	EI	5291
$\text{C}_3\text{O}_3\text{Cr}^+$	$(\text{CO})_6\text{Cr}$	13007-92-6	3CO	11.35 ± 0.03	EI	5291
	$\text{CS}(\text{CO})_5\text{Cr}$	50358-90-2	2CO + CS	12.06 ± 0.05	EI	5291
$\text{C}_4\text{O}_4\text{Cr}^+$	$(\text{CO})_6\text{Cr}$	13007-92-6	2CO	10.45 ± 0.03	EI	5291
	$\text{CS}(\text{CO})_5\text{Cr}$	50358-90-2	CO + CS	11.12 ± 0.05	EI	5291
$\text{C}_5\text{O}_5\text{Cr}^+$	$(\text{CO})_6\text{Cr}$	13007-92-6	CO	9.85 ± 0.03	EI	5291
	$\text{CS}(\text{CO})_5\text{Cr}$	50358-90-2	CS	10.58 ± 0.07	EI	5291
$\text{C}_6\text{O}_6\text{Cr}^+$	$(\text{CO})_6\text{Cr}$	13007-92-6	**	8.40 ± 0.02 (V)	PE	3979
			**	8.40 (V)	PE	4456
			**	8.40 (V)	PE	5333
			**	8.41 (V)	PE	4692
			**	8.19 ± 0.1	EI	3582
			**	8.20	EI	5453
			**	8.30 ± 0.05	EI	4600
			**	8.42 ± 0.03	EI	5291
$\text{C}_7\text{H}_6\text{OCr}^+$	$(\text{C}_6\text{H}_6)(\text{CO})_3\text{Cr}$ (Chromium, (η^6 -benzene)tricarbonyl-)	12082-08-5	2CO	7.9 ± 0.2	EI	3786
			2CO	8.09 ± 0.1	EI	3788
$\text{C}_7\text{H}_8\text{OCr}^+$	$(\text{C}_6\text{H}_5\text{CH}_2\text{OH})(\text{CO})_3\text{Cr}$ (Chromium, [(1,2,3,4,5,6- η)-benzenemethanol]tricarbonyl-)	12116-45-9	3CO	10.35 ± 0.1	EI	3788
	$(\text{C}_6\text{H}_5\text{OCH}_3)(\text{CO})_3\text{Cr}$ (Chromium, tricarbonyl[(1,2,3,4,5,6- η)-methoxybenzene]-)	12116-44-8	3CO	9.90 ± 0.1	EI	3788
$\text{C}_8\text{H}_8\text{OCr}^+$	$(\text{C}_6\text{H}_5\text{CH}_3)(\text{CO})_3\text{Cr}$ (Chromium, tricarbonyl[(1,2,3,4,5,6- η)-methylbenzene]-)	12083-24-8	2CO	8.11 ± 0.1	EI	3788
$\text{C}_9\text{H}_{10}\text{OCr}^+$	$(\text{C}_6\text{H}_4(\text{CH}_3)_2)(\text{CO})_3\text{Cr}$ (Chromium, tricarbonyl[(1,2,3,4,5,6- η)-1,2-dimethylbenzene]-)	12129-29-2	2CO	7.85 ± 0.1	EI	3788
$\text{C}_{10}\text{H}_{12}\text{OCr}^+$	$(\text{C}_6\text{H}_3(\text{CH}_3)_3)(\text{CO})_3\text{Cr}$ (Chromium, tricarbonyl[(1,2,3,4,5,6- η)-1,3,5-trimethylbenzene]-)	12129-67-8	2CO	8.00 ± 0.1	EI	3788
$\text{C}_{13}\text{H}_{18}\text{OCr}^+$	$(\text{C}_6(\text{CH}_3)_6)(\text{CO})_3\text{Cr}$ (Chromium, tricarbonyl[(1,2,3,4,5,6- η)-hexamethylbenzene]-)	12088-11-8	2CO	7.70 ± 0.1	EI	3788
$\text{C}_8\text{H}_6\text{O}_2\text{Cr}^+$	$(\text{C}_6\text{H}_6)(\text{CO})_3\text{Cr}$ (Chromium, (η^6 -benzene)tricarbonyl-)	12082-08-5	CO	7.25 ± 0.1	EI	3788
			CO	7.4 ± 0.2	EI	3786
$\text{C}_8\text{H}_8\text{O}_2\text{Cr}^+$	$(\text{C}_6\text{H}_5\text{CH}_2\text{OH})(\text{CO})_3\text{Cr}$ (Chromium, [(1,2,3,4,5,6- η)-benzenemethanol]tricarbonyl-)	12116-45-9	2CO	8.19 ± 0.1	EI	3788
	$(\text{C}_6\text{H}_5\text{OCH}_3)(\text{CO})_3\text{Cr}$ (Chromium, tricarbonyl[(1,2,3,4,5,6- η)-methoxybenzene]-)	12116-44-8	2CO	7.90 ± 0.1	EI	3788

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_8H_8O_2Cr^+$	(C ₆ H ₅ COOCH ₃)(CO) ₃ Cr (Chromium, tricarbonyl[(1,2,3,4,5,6- η)-methylbenzoate]-)	12125-87-0	3CO	9.1	EI	5448
	C ₁₁ H ₈ O ₂ SCr (Chromium, (carbonothioyl)dicarbonyl[(1,2,3,4,5,6- η)-methylbenzoate]-)	52140-27-9	3CO 2CO + CS	10.00 ± 0.1	EI	3788
				11.3	EI	5448
$C_9H_8O_2Cr^+$	(C ₆ H ₅ CH ₃)(CO) ₃ Cr (Chromium, tricarbonyl[(1,2,3,4,5,6- η)-methylbenzene]-)	12083-24-8	CO	7.09 ± 0.1	EI	3788
$C_{10}H_{10}O_2Cr^+$	(C ₆ H ₄ (CH ₃) ₂)(CO) ₃ Cr (Chromium, tricarbonyl[(1,2,3,4,5,6- η)-1,2-dimethylbenzene]-)	12129-29-2	CO	7.00 ± 0.1	EI	3788
$C_{11}H_{12}O_2Cr^+$	(C ₆ H ₃ (CH ₃) ₃)(CO) ₃ Cr (Chromium, tricarbonyl[(1,2,3,4,5,6- η)-1,3,5-trimethylbenzene]-)	12129-67-8	CO	6.69 ± 0.1	EI	3788
$C_{11}H_{18}O_2Cr^+$	(C ₆ (CH ₃) ₆)(CO) ₃ Cr (Chromium, tricarbonyl[(1,2,3,4,5,6- η)-hexamethylbenzene]-)	12088-11-8	CO	6.45 ± 0.1	EI	3788
$C_9H_6O_3Cr^+$	C ₇ H ₆ (CO) ₃ Cr (Chromium, (η^6 -benzene)tricarbonyl-)	12082-08-5	**	7.42 ± 0.03 (V)	PE	4447
			**	6.74 ± 0.1	EI	3788
			**	7.0 ± 0.2	EI	3786
			**	7.28	CTS	4029
$C_9H_8O_3Cr^+$	(C ₆ H ₅ CH ₂ OH)(CO) ₃ Cr (Chromium, [(1,2,3,4,5,6- η)-benzenemethanol]tricarbonyl-)	12116-45-9	CO	7.32 ± 0.1	EI	3788
	(C ₆ H ₅ OCH ₃)(CO) ₃ Cr (Chromium, tricarbonyl[(1,2,3,4,5,6- η)-methoxybenzene]-)	12116-44-8	CO	6.95 ± 0.1	EI	3788
	(C ₆ H ₅ COOCH ₃)(CO) ₃ Cr (Chromium, tricarbonyl[(1,2,3,4,5,6- η)-methylbenzoate]-)	12125-87-0	2CO	7.7	EI	5448
			2CO	8.27 ± 0.1	EI	3788
$C_{10}H_8O_3Cr^+$	C ₇ H ₆ (CO) ₃ Cr (Chromium, tricarbonyl[(1,2,3,4,5,6- η)-1,3,5-cycloheptatriene]-)	12125-72-3	**	7.18 (V)	PE	5206
			**	7.30 ± 0.05 (V)	PE	4724
			**	6.9 ± 0.2	EI	5210
	(C ₆ H ₅ CH ₃)(CO) ₃ Cr (Chromium, tricarbonyl[(1,2,3,4,5,6- η)-methylbenzene]-)	12083-24-8	**	6.6 ± 0.2	EI	5210
			**	6.69 ± 0.1	EI	3788
			**	7.29	CTS	4029
$C_{11}H_{10}O_3Cr^+$	(C ₆ H ₄ (CH ₃) ₂)(CO) ₃ Cr (Chromium, tricarbonyl[(1,2,3,4,5,6- η)-1,2-dimethylbenzene]-)	12129-29-2	**	6.70 ± 0.1	EI	3788
			**	7.29	CTS	4029
$C_{12}H_{12}O_3Cr^+$	(C ₆ H ₃ (CH ₃) ₃)(CO) ₃ Cr (Chromium, tricarbonyl[(1,2,3,4,5,6- η)-1,3,5-trimethylbenzene]-)	12129-67-8	**	7.20 ± 0.05 (V)	PE	4724
			**	7.20 (V)	PE	5286
			**	7.20 (V)	PE	5367
			**	6.60 ± 0.1	EI	3788
			**	7.29	CTS	4029

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{13}H_{18}O_3Cr^+$	$(C_6(CH_3)_6)(CO)_3Cr$	12088-11-8	**	7.00 (V)	PE	5286
	(Chromium, tricarbonyl[(1,2,3,4,5,6- η)-hexamethylbenzene]-)		**	6.35 \pm 0.1	EI	3788
$C_{10}H_8O_4Cr^+$	$(C_6H_5CH_2OH)(CO)_3Cr$	12116-45-9	**	6.92 \pm 0.1	EI	3788
	(Chromium, [(1,2,3,4,5,6- η)-benzenemethanol]tricarbonyl-)					
	$(C_6H_5OCH_3)(CO)_3Cr$	12116-44-8	**	6.75 \pm 0.1	EI	3788
	(Chromium, tricarbonyl[(1,2,3,4,5,6- η)-methoxybenzene]-)		**	7.32	CTS	4029
	$(C_6H_5COOCH_3)(CO)_3Cr$	12125-87-0	CO	7.60 \pm 0.1	EI	3788
	(Chromium, tricarbonyl[(1,2,3,4,5,6- η)-methylbenzoate]-)					
$C_{11}H_8O_4Cr^+$	$(C_7H_8)(CO)_3Cr$	12146-36-0	**	7.28 (V)	PE	5367
	(Chromium, [(2,3,5,6- η)-bicyclo[2.2.1]hepta-2,5-diene]tetracarbonyl-)					
$C_{11}H_8O_5Cr^+$	$(C_6H_5COOCH_3)(CO)_3Cr$	12125-87-0	**	7.02 \pm 0.1	EI	3788
	(Chromium, tricarbonyl[(1,2,3,4,5,6- η)-methylbenzoate]-)					
			**	7.1	EI	5448
$C_8H_6O_6Cr^+$	$CH_3C(OCH_3)(CO)_3Cr$	20540-69-6	**	7.47 (V)	PE	4692
			**	7.46 \pm 0.1	EI	3582
$C_{13}H_8O_6Cr^+$	$C_6H_5C(OCH_3)(CO)_3Cr$	27436-93-7	**	7.39 (V)	PE	4692
	(Chromium, pentacarbonyl(methoxyphenylmethylene)-(OC-6-21)-)		**	7.26 \pm 0.1	EI	3582
$C_{11}H_{10}O_6Cr^+$	$(C_6H_4(CH_3)COCH_3)(CO)_3Cr$	29160-36-9	**	7.13 \pm 0.1	EI	3582
	(Chromium, pentacarbonyl(methoxy(4-methylphenyl)methylene)-, (OC-6-21)-)					
$C_{13}H_{21}O_6Cr^+$	$(CH_3COCHCOCH_3)_3Cr$	21679-31-2	**	7.46 \pm 0.07 (V)	PE	3682
	(Chromium, tris(2,4-pentanedionato- <i>O,O'</i>)-, (OC-6-11)-)					
$C_{11}H_6O_7Cr^+$	$C_3H_3OC(OCH_3)(CO)_3Cr$	34741-93-0	**	7.37 (V)	PE	4692
	(Chromium, pentacarbonyl(2-furanylmethoxymethylene)-(OC-6-21)-)					
$C_{11}H_{10}O_7Cr^+$	$(C_6H_4(OCH_3)COCH_3)(CO)_3Cr$	27436-99-3	**	7.05 \pm 0.1	EI	3582
	(Chromium, pentacarbonyl(<i>o</i> , α -dimethoxybenzylidene)-)					
$C_8H_{12}O_8Cr_2^+$	$Cr_2(O_2CCH_3)_4$	15020-15-2	**	8.65 \pm 0.05 (V)	PE	4986
$C_{12}H_{20}O_8Cr_2^+$	$Cr_2(O_2CC_2H_5)_4$	XXXXX-XX-X	**	8.104 \pm 0.05 (V)	PE	4986
$C_5H_3NOCr^+$	$(C_5H_3)(CO)_2(NO)Cr$	36312-04-6	2CO	10.53 \pm 0.1	EI	5348
	(Chromium, dicarbonyl(η^5 -2,4-cyclopentadien-1-yl)nitrosyl-)					
$C_7H_7NOCr^+$	$(C_6H_5NH_2)(CO)_3Cr$	12108-11-1	2CO	7.84 \pm 0.1	EI	3788
	(Chromium, (η^6 -benzenamine)tricarbonyl-)					

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$\text{C}_6\text{H}_5\text{NO}_2\text{Cr}^+$	$(\text{C}_5\text{H}_5)(\text{CO})_2(\text{NO})\text{Cr}$ (Chromium, dicarbonyl(η^5 -2,4-cyclopentadien-1-yl)nitrosyl-)	36312-04-6	CO	9.37 ± 0.1	EI	5348
$\text{C}_8\text{H}_7\text{NO}_2\text{Cr}^+$	$(\text{C}_6\text{H}_5\text{NH}_2)(\text{CO})_3\text{Cr}$ (Chromium, (η^6 -benzenamine)tricarbonyl-)	12108-11-1	CO	6.75 ± 0.1	EI	3788
$\text{C}_7\text{H}_5\text{NO}_3\text{Cr}^+$	$(\text{C}_5\text{H}_5)(\text{NO})(\text{CO})_2\text{Cr}$ (Chromium, dicarbonyl(η^5 -2,4-cyclopentadien-1-yl)nitrosyl-)	36312-04-6	**	7.80	EI	3579
				8.51 ± 0.1	EI	5348
$\text{C}_9\text{H}_7\text{NO}_3\text{Cr}^+$	$(\text{C}_6\text{H}_5\text{NH}_2)(\text{CO})_3\text{Cr}$ (Chromium, (η^6 -benzenamine)tricarbonyl-)	12108-11-1	**	6.52 ± 0.1	EI	3788
$\text{C}_{11}\text{H}_{11}\text{NO}_3\text{Cr}^+$	$\text{C}_6\text{H}_5\text{N}(\text{CH}_3)_2\text{Cr}(\text{CO})_3$ (Chromium, tricarbonyl(<i>N,N</i> -dimethylbenzenamine)-)	12109-10-3	**	7.38	CTS	4029
$\text{C}_5\text{H}_3\text{NO}_5\text{Cr}^+$	$(\text{CO})_5\text{NH}_3\text{Cr}$	15228-27-0	**	7.56 (V)	PE	4252
				7.56 (V)	PE	5540
$\text{C}_7\text{H}_3\text{NO}_5\text{Cr}^+$	$(\text{CO})_5\text{CNCH}_3\text{Cr}$	33726-04-4	**	7.61 (V)	PE	4252
$\text{C}_7\text{H}_5\text{NO}_5\text{Cr}^+$	$\text{CH}_3\text{C}(\text{NH}_2)(\text{CO})_5\text{Cr}$	22852-50-2	**	7.45 (V)	PE	4692
$\text{C}_8\text{H}_9\text{NO}_5\text{Cr}^+$	$(\text{CO})_5\text{N}(\text{CH}_3)_3\text{Cr}$	15228-26-9	**	7.45 (V)	PE	4252
$\text{C}_9\text{H}_9\text{NO}_5\text{Cr}^+$	$\text{CH}_3\text{C}(\text{N}(\text{CH}_3)_2)(\text{CO})_5\text{Cr}$	22852-52-4	**	7.12 (V)	PE	4692
$\text{C}_{10}\text{H}_5\text{NO}_5\text{Cr}^+$	$(\text{C}_5\text{H}_5\text{N})(\text{CO})_5\text{Cr}$ (Chromium, pentacarbonyl(pyridine)-(OC-6-22)-)	14740-77-3	**	7.30 (V)	PE	5566
$\text{C}_{10}\text{H}_{11}\text{NO}_5\text{Cr}^+$	$(\text{C}_5\text{H}_{10}\text{NH})(\text{CO})_5\text{Cr}$ (Chromium, pentacarbonyl(piperidine)-(OC-6-22))	15710-39-1	**	7.39 (V)	PE	5540
$\text{C}_{11}\text{H}_7\text{NO}_5\text{Cr}^+$	$(\text{CH}_3\text{C}_5\text{H}_4\text{N})(\text{CO})_5\text{Cr}$ (Chromium, pentacarbonyl(4-methylpyridine)-(OC-6-22)-)	64914-26-7	**	7.22 (V)	PE	5566
$\text{C}_{12}\text{H}_7\text{NO}_5\text{Cr}^+$	$\text{C}_6\text{H}_5\text{C}(\text{NH}_2)(\text{CO})_5\text{Cr}$ (Chromium, (aminophenylmethylene)pentacarbonyl-(OC-6-21)-)	32370-44-8	**	7.25 (V)	PE	4692
$\text{C}_{11}\text{H}_{11}\text{NO}_5\text{Cr}^+$	$\text{C}_6\text{H}_5\text{C}(\text{N}(\text{CH}_3)_2)(\text{CO})_5\text{Cr}$ (Chromium, pentacarbonyl[(dimethylamino)phenylmethylene]-(OC-6-21)-)	30971-68-7	**	7.02 (V)	PE	4692
$\text{C}_{11}\text{H}_{13}\text{NO}_5\text{Cr}^+$	<i>tert</i> - $\text{C}_1\text{H}_7\text{C}_5\text{H}_4\text{N})(\text{CO})_5\text{Cr}$ (Chromium, pentacarbonyl[4-(1,1-dimethylethyl)pyridine]-(OC-6-22)-)	64914-25-6	**	7.17 (V)	PE	5566

Table of Ion Energetics Measurements—Continued

Ion	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$\text{C}_8\text{H}_4\text{N}_2\text{O}_5\text{Cr}^+$	$(\text{C}_3\text{H}_3\text{N}_2)(\text{CO})_5\text{Cr}$ (Chromium, pentacarbonyl(1H-pyrazole- N^2)-(OC-6-22)-)	71127-65-6	**	7.40 (V)	PE	5213
$\text{C}_{12}\text{H}_{14}\text{N}_2\text{O}_5\text{Cr}^+$	$(\text{C}_3\text{H}_4\text{N}_2(\text{C}_2\text{H}_5)_2)(\text{CO})_5\text{Cr}$	XXXXX-XX-X	**	7.12 (V)	PE	5601
$\text{C}_8\text{H}_3\text{NO}_6\text{Cr}^+$	$(\text{C}_3\text{H}_3\text{NO})(\text{CO})_5\text{Cr}$ (Chromium, pentacarbonyl(isoxazole- N^2)-(OC-6-22)-)	71127-67-8	**	7.42 (V)	PE	5213
$\text{C}_{10}\text{H}_5\text{NO}_6\text{Cr}^+$	$\text{C}_3\text{H}_3\text{OC}(\text{NH}_2)(\text{CO})_5\text{Cr}$ (Chromium, (amino-2-furanylmethylene)pentacarbonyl-(OC-6-21)-)	29130-96-9	**	7.22 (V)	PE	4692
$\text{C}_{11}\text{H}_7\text{NO}_6\text{Cr}^+$	$(\text{CH}_3\text{OC}_3\text{H}_4\text{N})(\text{CO})_5\text{Cr}$ (Chromium, pentacarbonyl(4-methoxypyridine- N^1)-(OC-6-22)-)	64914-33-6	**	7.18 (V)	PE	5566
$\text{C}_{12}\text{H}_7\text{NO}_6\text{Cr}^+$	$(\text{CH}_3\text{COC}_3\text{H}_4\text{N})(\text{CO})_5\text{Cr}$ (Chromium, pentacarbonyl[1-(4-pyridinyl)ethanone- N^1](OC-6-22)-)	64914-29-0	**	7.5 (V)	PI	5566
$\text{C}_{24}\text{H}_{24}\text{N}_4\text{O}_4\text{Cr}_2^+$	$(\text{C}_5\text{H}_3\text{N}(\text{O})\text{CH}_3)_4\text{Cr}_2$ (Chromium, tetrakis[μ -(6-methyl-2(1H)-pyridinonato- $\text{N}^1\text{:O}^3$)]di-(Cr-Cr), stereoisomer)	67634-82-6	**	6.8 (V)	PE	5191
FCr^+	CrF	13943-42-5	**	9.3 ± 0.4	EI	5440
	CrF ₂	10049-10-2	F	14.7 ± 0.5	EI	5440
F_2Cr^+	CrF ₂	10049-10-2	**	10.6 ± 0.3	EI	5440
	CrF ₃	7788-97-8	F	14.8 ± 0.5	EI	5440
F_3Cr^+	CrF ₃	7788-97-8	**	12.5 ± 0.3	EI	5440
$\text{C}_{13}\text{H}_7\text{O}_6\text{FCr}^+$	$(\text{C}_6\text{H}_4\text{FCOCH}_3)(\text{CO})_5\text{Cr}$ (Chromium, pentacarbonyl[(4-fluorophenyl)methoxymethylene]-, (OC-6-21)-)	27436-94-8	**	7.32 ± 0.1	EI	3582
$\text{C}_{14}\text{H}_7\text{O}_6\text{F}_3\text{Cr}^+$	$(\text{C}_6\text{H}_3(\text{CF}_3)\text{COCH}_3)(\text{CO})_5\text{Cr}$ (Chromium, pentacarbonyl[α -methoxy- <i>o</i> -(trifluoromethyl)benzylidene]-)	32011-10-2	**	7.34 ± 0.1	EI	3582
	$(\text{C}_6\text{H}_3(\text{CF}_3)\text{COCH}_3)(\text{CO})_5\text{Cr}$ (Chromium, pentacarbonyl[methoxy[4-(trifluoromethyl)phenyl]methylene]-, (OC-6-21)-)	27637-27-0	**	7.42 ± 0.1	EI	3582
$\text{C}_{15}\text{H}_{12}\text{O}_6\text{F}_9\text{Cr}^+$	$(\text{CF}_3\text{COCHCOCH}_3)_3\text{Cr}$ (Chromium, tris(1,1,1-trifluoro-2,4-pentanedionato- O, O')-)	14592-89-3	**	8.58 ± 0.07 (V)	PE	3682
$\text{C}_{15}\text{H}_3\text{O}_6\text{F}_{18}\text{Cr}^+$	$(\text{CF}_3\text{COCHCOCF}_3)_3\text{Cr}$ (Chromium, tris(1,1,1,5,5,5-hexafluoro-2,4-pentanedionato- O, O')-, (OC-6-11)-)	14592-80-4	**	9.53 (V)	PE	3681
			**	9.57 ± 0.07 (V)	PE	3682
$\text{C}_{16}\text{H}_{14}\text{Si}_4\text{Cr}^+$	$((\text{CH}_3)_3\text{SiCH}_2)_4\text{Cr}$	35394-18-4	**	7.26 ± 0.1 (V)	PE	3830

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{13}H_{21}O_6Si_2Cr^+$	$C_{13}H_{21}O_6Si_2Cr$	XXXXXX-XX-X **		7.57 (V)	PE	5601
$C_{12}H_{27}PCr^+$	$((n-C_4H_9)_3P)(CO)_5Cr$	18497-59-1	5CO	11.05	EI	5564
$C_{18}H_{15}PCr^+$	$((C_6H_5)_3P)(CO)_5Cr$ (Chromium,pentacarbonyl(triphenylphosphine)-(OC-6-22))	14917-12-5	5CO	10.9	EI	5564
$C_6H_{18}N_3PCr^+$	$(((CH_3)_2N)_3P)(CO)_5Cr$	XXXXXX-XX-X	5CO	12.5 ± 0.05	EI	3952
	$(((CH_3)_2N)_3P)_2(CO)_4Cr$	19976-85-3		11.0 ± 0.05	EI	3952
$C_{13}H_{27}OPCr^+$	$((n-C_4H_9)_3P)(CO)_5Cr$	18497-59-1	4CO	9.65	EI	5564
$C_{19}H_{15}OPCr^+$	$((C_6H_5)_3P)(CO)_5Cr$ (Chromium,pentacarbonyl(triphenylphosphine)-(OC-6-22))	14917-12-5	4CO	9.7	EI	5564
$C_{11}H_{27}O_2PCr^+$	$((n-C_4H_9)_3P)(CO)_5Cr$	18497-59-1	3CO	8.85	EI	5564
$C_{20}H_{15}O_2PCr^+$	$((C_6H_5)_3P)(CO)_5Cr$ (Chromium,pentacarbonyl(triphenylphosphine)-(OC-6-22))	14917-12-5	3CO	9.3	EI	5564
$C_3H_9O_3PCr^+$	$(P(OCH_3)_3)(CO)_5Cr$	18461-34-2	5CO	11.5	EI	5564
$C_6H_{15}O_3PCr^+$	$(P(OC_2H_5)_3)(CO)_5Cr$	18461-32-0	5CO	11.8	EI	5564
$C_{15}H_{27}O_3PCr^+$	$((n-C_4H_9)_3P)(CO)_5Cr$	18497-59-1	2CO	8.55	EI	5564
$C_{21}H_{15}O_3PCr^+$	$((C_6H_5)_3P)(CO)_5Cr$ (Chromium,pentacarbonyl(triphenylphosphine)-(OC-6-22))	14917-12-5	2CO	9.1	EI	5564
$C_4H_9O_4PCr^+$	$(P(OCH_3)_3)(CO)_5Cr$	18461-34-2	4CO	10.1	EI	5564
$C_7H_{15}O_4PCr^+$	$(P(OC_2H_5)_3)(CO)_5Cr$	18461-32-0	4CO	10.0	EI	5564
$C_{16}H_{27}O_4PCr^+$	$((n-C_4H_9)_3P)(CO)_5Cr$	18497-59-1	CO	8.25	EI	5564
$C_{22}H_{15}O_4PCr^+$	$((C_6H_5)_3P)(CO)_5Cr$ (Chromium,pentacarbonyl(triphenylphosphine)-(OC-6-22))	14917-12-5	CO	8.5	EI	5564
$C_5H_3O_5PCr^+$	$(CO)_5PH_3Cr$	18116-53-5	**	7.90 (V)	PE	4252
$C_5H_9O_5PCr^+$	$(P(OCH_3)_3)(CO)_5Cr$	18461-34-2	3CO	9.4	EI	5564
$C_8H_9O_5PCr^+$	$(CO)_5P(CH_3)_3Cr$	26555-09-9	**	7.58 (V)	PE	4252

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization of appearance potential (eV)	Method	Ref.
$C_8H_9O_5PCr^+$	$(CO)_5P(CH_3)_3Cr$	26555-09-9	**	7.6	PE	5602
$C_8H_{15}O_5PCr^+$	$P(OC_2H_5)_3(CO)_5Cr$	18461-32-0	3CO	9.2	EI	5564
$C_{11}H_{15}O_5PCr^+$	$((C_2H_5)_3P)(CO)_5Cr$	21321-30-2	**	7.6	PE	5602
$C_{11}H_{17}O_5PCr^+$	$C_{13}H_{17}O_7PCr$ (Chromium,dicarbonyl[(1,2,3,4,5,6- η)-methylbenzoate](trimethyl phosphite-P)-)	53248-14-9	2CO	7.2	EI	5448
$C_{23}H_{15}O_5PCr^+$	$(C_6H_5)_3P(CO)_5Cr$ (Chromium, pentacarbonyl (triphenylphosphine)-(OC-6-22)-)	14917-12-5	**	7.30 (V)	PE	5139
			**	7.40 \pm 0.05	EI	4600
$C_{23}H_{33}O_5PCr^+$	$(C_6H_{11})_3P(CO)_5Cr$ (Chromium, pentacarbonyl (tricyclohexylphosphine)-(OC-6-22)-)	15603-93-7	**	7.24 (V)	PE	5139
$C_{26}H_{23}O_5PCr^+$	$C_{28}H_{23}O_7PCr$ (Chromium,dicarbonyl[(1,2,3,4,5,6- η)-methyl benzoate](triphenyl phosphite-P)-)	63928-77-8	2CO	7.2	EI	5448
$C_6H_6O_6PCr^+$	$P(OCH_3)_3(CO)_5Cr$	18461-34-2	$OCH_3 + CO$	11.9	EI	5564
$C_6H_9O_6PCr^+$	$P(OCH_3)_3(CO)_5Cr$	18461-34-2	2CO	8.7	EI	5564
$C_9H_{15}O_6PCr^+$	$P(OC_2H_5)_3(CO)_5Cr$	18461-32-0	2CO	8.8	EI	5564
$C_7H_6O_7PCr^+$	$P(OCH_3)_3(CO)_5Cr$	18461-34-2	OCH_3	10.8	EI	5564
$C_7H_9O_7PCr^+$	$P(OCH_3)_3(CO)_5Cr$	18461-34-2	CO	8.25	EI	5564
$C_9H_{10}O_7PCr^+$	$P(OC_2H_5)_3(CO)_5Cr$	18461-32-0	OC_2H_5	11.1	EI	5564
$C_{10}H_{15}O_7PCr^+$	$P(OC_2H_5)_3(CO)_5Cr$	18461-32-0	CO	8.3	EI	5564
$C_{13}H_{17}O_7PCr^+$	$C_{13}H_{17}O_7PCr$ (Chromium,dicarbonyl[(1,2,3,4,5,6- η)-methylbenzoate](trimethyl phosphite-P)-)	53248-14-9	**	6.6	EI	5448
$C_{28}H_{23}O_7PCr^+$	$C_{28}H_{23}O_7PCr$ (Chromium,dicarbonyl[(1,2,3,4,5,6- η)-methyl benzoate](triphenyl phosphite-P)-)	63928-77-8	**	6.8	EI	5448
$C_8H_9O_8PCr^+$	$((CH_3O)_3P)(CO)_5Cr$	18461-34-2	**	8.0	PE	5602

Table of Ion Energetics Measurements—Continued

Ion	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{11}H_{15}O_8PCr^+$	$((C_2H_5O)_3P)(CO)_5Cr$	18461-32-0	**	7.9	PE	5602
$C_{11}H_{21}O_8PCr^+$	$(iso-C_3H_7O)_3P(CO)_5Cr$	XXXXX-XX-X	**	7.61 (V)	PE	5139
$C_{23}H_{15}O_8PCr^+$	$(C_6H_5O)_3P(CO)_5Cr$ (Chromium, pentacarbonyl (triphenyl phosphite-P)-(OC-6-22)-)	18461-39-7	**	7.67 (V)	PE	5139
$C_7H_{18}N_3OPCr^+$	$((CH_3)_2N)_3P(CO)_5Cr$	XXXXX-XX-X	4CO	9.8 ± 0.05	EI	3952
$C_9H_{18}N_3O_3PCr^+$	$((CH_3)_2N)_3P(CO)_5Cr$	XXXXX-XX-X	2CO	8.6 ± 0.05	EI	3952
$C_{10}H_{18}N_3O_4PCr^+$	$((CH_3)_2N)_3P(CO)_5Cr$	XXXXX-XX-X	CO	7.6 ± 0.05	EI	3952
$C_{11}H_{18}N_3O_5PCr^+$	$((CH_3)_2N)_3P(CO)_5Cr$	15137-66-3	**	6.6 ± 0.05	EI	3952
			**	7.6	PE	5602
$C_{16}H_{30}N_2O_3P_2Cr^+$	$C_{10}H_{30}N_2O_3P_2Cr$	XXXXX-XX-X	**	6.70 (V)	PE	5601
$C_{15}H_{36}N_6O_3P_2Cr^+$	$((CH_3)_2N)_3P_2(CO)_4Cr$	19976-85-3	CO	9.5 ± 0.05	EI	3952
$C_{16}H_{36}N_6O_4P_2Cr^+$	$((CH_3)_2N)_3P_2(CO)_4Cr$	19976-85-3	**	6.5 ± 0.05	EI	3952
$F_{18}P_6Cr^+$	$(PF_3)_6Cr$	26117-61-3	**	9.0	PE	4021
			**	9.29 (V)	PE	4456
$C_3H_9N_3F_{12}P_6Cr^+$	$(CH_3)_3N(PF_3)_2)_3Cr$	63404-40-0	**	7.70 (V)	PE	5376
$C_5O_5F_3PCr^+$	$(PF_3)(CO)_5Cr$	18461-42-2	**	8.56 (V)	PE	5539
			**	8.7	PE	5602
			**	8.70	EI	5453
$C_4O_4F_6P_2Cr^+$	$(PF_3)_2(CO)_4Cr$	31616-42-9	**	8.85	EI	5453
$C_3O_3F_9P_3Cr^+$	$(PF_3)_3(CO)_3Cr$	31616-43-0	**	8.90	EI	5453
$CSCr^+$	$CS(CO)_5Cr$	50358-90-2	5CO	13.68 ± 0.04	EI	5291
$C_3H_5NSCr^+$	$(C_3H_5)(CO)_2(NS)Cr$ (Chromium, dicarbonyl(η^5 -2,4-cyclopentadien-1-yl)thionitrosyl-)	66539-91-1	2CO	9.07 ± 0.1	EI	5348
C_2OSCr^+	$CS(CO)_5Cr$	50358-90-2	4CO	12.12 ± 0.04	EI	5291
$C_3O_2SCr^+$	$CS(CO)_5Cr$	50358-90-2	3CO	11.12 ± 0.04	EI	5291

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_1O_3SCr^+$	$CS(CO)_3Cr$	50358-90-2	2CO	10.22 ± 0.04	EI	5291
$C_5O_4SCr^+$	$CS(CO)_3Cr$	50358-90-2	CO	9.39 ± 0.04	EI	5291
$C_6O_5SCr^+$	$(CS)(CO)_3Cr$	50358-90-2	**	8.16 (V)	PE	5333
			**	8.16 (V)	PE	5518
			**	8.31 ± 0.03	EI	5291
$C_9H_8O_2SCr^+$	$(C_6H_5COOCH_3)(CS)(CO)_2Cr$ (Chromium,(carbonothioyl)dicarbonyl[(1,2,3,4,5,6- η)-methylbenzoate]-)	52140-27-9	2CO	9.2	EI	5448
$C_{11}H_8O_4SCr^+$	$(C_6H_5COOCH_3)(CS)(CO)_2Cr$ (Chromium,(carbonothioyl)dicarbonyl[(1,2,3,4,5,6- η)-methylbenzoate]-)	52140-27-9	**	7.8	EI	5448
$C_8H_6O_5SCr^+$	$CH_3C(SCH_3)(CO)_3Cr$	35797-92-3	**	7.35 (V)	PE	4692
$C_9H_8O_5SCr^+$	$(S(CH_2)_4)(CO)_3Cr$ (Chromium,pentacarbonyl(tetrahydrothiophene)-)	15038-40-1	**	7.45	EI	5292
			**	7.45 ± 0.05	EI	3498
$C_7H_6O_6SCr^+$	$(SO(CH_3)_2)(CO)_3Cr$	36083-80-4	**	7.64	EI	5292
			**	7.64 ± 0.05	EI	3498
$C_7H_4O_8SCr^+$	$(SO(OCH_2)_2)(CO)_3Cr$	36252-44-5	**	7.80	EI	5292
			**	7.80 ± 0.05	EI	3498
$C_6H_5NOSCr^+$	$(C_5H_5)(CO)_2(NS)Cr$ (Chromium,dicarbonyl(η^5 -2,4-cyclopentadien-1-yl)thionitrosyl-)	66539-91-1	CO	8.15 ± 0.1	EI	5348
$C_7H_5NO_2SCr^+$	$(C_5H_5)(CO)_2(NS)Cr$ (Chromium,dicarbonyl(η^5 -2,4-cyclopentadien-1-yl)thionitrosyl-)	66539-91-1	**	7.83 ± 0.1	EI	5348
$C_8H_3NO_3SCr^+$	$(C_3H_3NS)(CO)_3Cr$ (Chromium,pentacarbonyl(isothiazole- N^2)-(OC-6-22)-)	39554-14-8	**	7.32 (V)	PE	5213
	$(C_3H_3NS)(CO)_3Cr$ (Chromium,pentacarbonyl(thiazole- N^3)-(OC-6-22)-)	55293-31-7	**	7.36 (V)	PE	5213
$C_{27}H_{23}O_5PSCr^+$	$C_{26}H_{21}O_6PSCr$ (Chromium,(carbonothioyl)carbonyl[(1,2,3,4,5,6- η)-methyl benzoate](triphenyl phosphite-P)-)	57546-01-7	CO	8.8 ± 0.3	EI	5448
			CO	8.8 ± 0.3	EI	5448
$C_{28}H_{23}O_6PSCr^+$	$C_{27}H_{21}O_7PSCr$ (Chromium,(carbonothioyl)carbonyl[(1,2,3,4,5,6- η)-methyl benzoate](triphenyl phosphite-P)-)	57546-01-7	**	7.4	EI	5448
			**	7.4	EI	5448
$C_{12}H_{30}O_6P_3S_6Cr^+$	$((C_2H_5)_2S_2PO_2)_3Cr$	14177-95-8	**	7.71 (V)	PE	5203

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
Cl_2Cr^+	CrCl_2	10049-05-5	**	9.97 (V)	PE	5172
$\text{C}_6\text{H}_5\text{ClCr}^+$	(C ₆ H ₅ Cl)(CO) ₃ Cr (Chromium, tricarbonyl(η^6 -chlorobenzene)-)	12082-03-0	3CO	10.10±0.1	EI	3788
$\text{O}_2\text{Cl}_2\text{Cr}^+$	CrO_2Cl_2	14977-61-8	** **	11.8 (V) 11.85±0.03 (V)	PE PE	4455 5148
$\text{C}_7\text{H}_5\text{OClCr}^+$	(C ₆ H ₅ Cl)(CO) ₃ Cr (Chromium, tricarbonyl(η^6 -chlorobenzene)-)	12082-03-0	2CO	8.18±0.1	EI	3788
$\text{C}_8\text{H}_5\text{O}_2\text{ClCr}^+$	(C ₆ H ₅ Cl)(CO) ₃ Cr (Chromium, tricarbonyl(η^6 -chlorobenzene)-)	12082-03-0	CO	7.45±0.1	EI	3788
$\text{C}_9\text{H}_5\text{O}_3\text{ClCr}^+$	(C ₆ H ₅ Cl)(CO) ₃ Cr (Chromium, tricarbonyl(η^6 -chlorobenzene)-)	12082-03-0	**	7.00±0.1	EI	3788
$\text{C}_{13}\text{H}_7\text{O}_6\text{ClCr}^+$	(C ₆ H ₄ ClCOCH ₃)(CO) ₅ Cr (Chromium, pentacarbonyl[(4-chlorophenyl)methoxymethylene]-, (OC-6-21)-)	29160-37-0	**	7.34±0.1	EI	3582
$\text{C}_{10}\text{H}_4\text{NO}_5\text{ClCr}^+$	(ClC ₅ H ₄ N)(CO) ₅ Cr (Chromium, pentacarbonyl(4-chloropyridine)-(OC-6-22)-)	64914-28-9	**	7.42 (V)	PI	5566
$\text{C}_5\text{O}_3\text{PCl}_3\text{Cr}^+$	(PCl ₃)(CO) ₃ Cr	18461-41-1	** **	8.32 (V) 8.26	PE EI	5539 5453
Mn^+	Mn	7439-96-5	** ** ** **	7.434 7.43 8.61 14.26	S PE PE PE	5497 4858 4858 4858
$(^1\text{S}_3)$	Mn	7439-96-5	**	7.434	S	5497
(^1S)	Mn	7439-96-5	**	7.43	PE	4858
(^3S)	Mn	7439-96-5	**	8.61	PE	4858
(^1D)	Mn	7439-96-5	**	14.26	PE	4858
(^1D)	C ₅ H ₅ (CO) ₃ Mn (Manganese, tricarbonyl(η^5 -2,4-cyclopentadien-1-yl)-)	12079-65-1	3CO + C ₅ H ₅	15.32±0.02	EI	4661
(^1D)	C ₅ H ₄ (CH ₃)(CO) ₃ Mn (Manganese, tricarbonyl[1,2,3,4,5- η]-1-methyl-2,4-cyclopentadien-1-yl]-)	12108-13-3	3CO + C ₆ H ₇	16.33±0.02	EI	4661
(^1D)	(CO) ₅ MnH	16972-33-1		17.3	EI	3814
(^1D)	(CH ₃) ₃ Si(CO) ₅ Mn	26500-16-3		21.7	EI	3814
(^1D)	(CH ₃) ₃ Si(CO) ₄ (PF ₃)Mn	33989-27-4		21.9	EI	3814
(^1D)	C ₅ H ₅ (CO) ₂ CSMn (Manganese, (carbonothioyl)dicarbonyl(η^5 -2,4-cyclopentadien-1-yl)-)	31741-76-1	2CO + CS + C ₅ H ₅	16.51±0.04	EI	4661
(^1D)	C ₅ H ₄ (CH ₃)(CO) ₂ CSMn (Manganese, (carbonothioyl)dicarbonyl[(1,2,3,4,5- η)-1-methyl-2,4-cyclopentadien-1-yl]-)	49716-52-1	2CO + CS + C ₆ H ₇	16.22±0.02	EI	4661
(^1D)	(C ₅ H ₅) ₂ (CS) ₂ (NO) ₂ Mn ₂ (Manganese, bis[μ -(carbonothioyl)bis(η^5 -2,4-cyclopentadien-1-yl) dinitrosyl]-(<i>Mn-Mn</i>)-)	64090-73-9		26.71±0.03	EI	5423
(^1D)	(C ₅ H ₅)(CS)(NO)MnI (Manganese, (carbonothioyl)(η^5 -2,4-cyclopentadien-1-yl)iodonitrosyl-)	58450-74-1		16.57±0.03	EI	5561
(^1D)	(CH ₃ C ₅ H ₄)(CS)(NO)MnI (Manganese, (carbonothioyl)(η^5 -2,4-cyclopentadien-1-yl)iodonitrosyl-)	XXXXX-XX-X		15.57±0.07	EI	5561

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
Mn_2^+	$(\text{C}_5\text{H}_5)_2(\text{CS})_2(\text{NO})_2\text{Mn}_2$ (Manganese, bis[μ -(carbonothioyl)bis(η^5 -2,4-cyclopentadien-1-yl) dinitrosyl-di-(<i>Mn-Mn</i>)-)	64090-73-9		28.38 ± 0.02	EI	5423
HMn^+	$(\text{CO})_5\text{MnH}$	16972-33-1	5CO	13.8	EI	3814
$\text{C}_5\text{H}_5\text{Mn}^+$	$\text{C}_5\text{H}_5(\text{CO})_3\text{Mn}$ (Manganese, tricarbonyl(η^5 -2,4-cyclopentadien-1-yl)-) $\text{C}_5\text{H}_5(\text{CO})_2\text{CSMn}$ (Manganese, (carbonothioyl)dicarbonyl(η^5 -2,4-cyclopentadien-1-yl)-) $(\text{C}_5\text{H}_5)_2(\text{CS})_2(\text{NO})_2\text{Mn}_2$ (Manganese, bis[μ -(carbonothioyl)bis(η^5 -2,4-cyclopentadien-1-yl) dinitrosyl-di-(<i>Mn-Mn</i>)-) $(\text{C}_5\text{H}_5)(\text{CS})(\text{NO})\text{MnI}$ (Manganese, (carbonothioyl)(η^5 -2,4-cyclopentadien-1-yl)iodonitrosyl-)	12079-65-1	3CO	11.67 ± 0.04	EI	4661
		31741-76-1	2CO + CS	12.25 ± 0.03	EI	4661
		64090-73-9		21.33 ± 0.16	EI	5423
		58450-74-1	NO + CS + I	12.84 ± 0.03	EI	5561
$\text{C}_6\text{H}_7\text{Mn}^+$	$\text{C}_5\text{H}_4(\text{CH}_3)(\text{CO})_3\text{Mn}$ (Manganese, tricarbonyl[1,2,3,4,5- η]-1-methyl-2,4-cyclopentadien-1-yl)-) $(\text{CH}_3\text{C}_5\text{H}_4)(\text{CO})_2((\text{C}_6\text{H}_5)_3\text{P})\text{Mn}$ (Manganese, dicarbonyl[1,2,3,4,5- η]-1-methyl-2,4-cyclopentadien-1-yl] (triphenylphosphine)-) $\text{C}_5\text{H}_4(\text{CH}_3)(\text{CO})_2\text{CSMn}$ (Manganese, (carbonothioyl)dicarbonyl[1,2,3,4,5- η]-1-methyl- 2,4-cyclopentadien-1-yl]-) $\text{C}_{20}\text{H}_{22}\text{OPSMn}$ (Manganese, (carbonothioyl)carbonyl[1,2,3,4,5- η]-1-methyl-2,4- cyclopentadien-1-yl](triphenylphosphine)-) $(\text{CH}_3\text{C}_5\text{H}_4)(\text{CO})_2((\text{C}_6\text{H}_5)_3\text{As})\text{Mn}$ (Manganese, dicarbonyl[1,2,3,4,5- η]-1-methyl-2,4- cyclopentadien-1-yl](triphenylarsine)-) $\text{C}_{20}\text{H}_{22}\text{OSMnAs}$ (Manganese, (carbonothioyl)carbonyl[1,2,3,4,5- η]-1- methyl-2,4-cyclopentadien-1-yl](triphenylarsine)-) $\text{C}_{20}\text{H}_{22}\text{O}_2\text{MnSb}$ (Manganese, dicarbonyl[1,2,3,4,5- η]-1-methyl-2,4-cyclopentadien- 1-yl](triphenylstibine)-) $(\text{CH}_3\text{C}_5\text{H}_4)(\text{CO})(\text{CS})((\text{C}_6\text{H}_5)_3\text{Sb})\text{Mn}$ (Manganese, (carbonothioyl)carbonyl[1,2,3,4,5- η]-1-methyl- 2,4-cyclopentadien-1-yl](triphenylstibine)-) $(\text{CH}_3\text{C}_5\text{H}_4)(\text{CS})(\text{NO})\text{MnI}$ (Manganese, (carbonothioyl)[1,2,3,4,5- η]-1-methyl- 2,4-cyclopentadien-1-yl]iodonitrosyl-)	12108-13-3	3CO	11.21 ± 0.03	EI	4661
		12100-95-7		15.97 ± 0.09	EI	5576
		49716-52-1	2CO + CS	12.20 ± 0.01	EI	4661
		70279-43-5		16.23 ± 0.02	EI	5576
		XXXXX-XX-X		14.73 ± 0.02	EI	5576
		XXXXX-XX-X		15.68 ± 0.06	EI	5576
		XXXXX-XX-X		14.51 ± 0.04	EI	5576
		XXXXX-XX-X		14.95 ± 0.10	EI	5576
		XXXXX-XX-X	NO + CS + I	13.19 ± 0.04	EI	5561
$\text{C}_{10}\text{H}_{10}\text{Mn}^+$	$(\text{C}_5\text{H}_5)_2\text{Mn}$ (Manganocene) $(\text{C}_5\text{H}_5)_2(\text{CS})_2(\text{NO})_2\text{Mn}_2$ (Manganese, bis[μ -(carbonothioyl)bis(η^5 -2,4-cyclopentadien-1-yl) dinitrosyl-di-(<i>Mn-Mn</i>)-)	1271-27-8	**	6.26 (V)	PE	5394
			**	6.26 (V)	PE	5507
			**	6.55	PE	3725
		64090-73-9		16.16 ± 0.03	EI	5423
$\text{C}_{11}\text{H}_{11}\text{Mn}^+$	$(\text{C}_5\text{H}_5)(\text{C}_6\text{H}_5)\text{Mn}$ (Manganese, (η^5 -benzene)(η^5 -2,4-cyclopentadien-1-yl)-)	1271-43-8	**	6.36 ± 0.1 (V)	PE	3686
$\text{C}_{12}\text{H}_{14}\text{Mn}^+$	$(\text{C}_5\text{H}_4\text{CH}_3)_2\text{Mn}$ (Manganocene, 1,1'-dimethyl-)	32985-17-4	**	6.01 (V)	PE	5507

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{12}H_{11}Mn^+$	$(C_5H_1CH_3)_2Mn$	32985-17-4	**	6.06 (V)	PE	5394
$C_{20}H_{30}Mn^+$	$(C_5(CH_3)_3)_2Mn$ (Manganocene, decamethyl-)	XXXXX-XX-X	**	5.33 (V)	PE	5394
$C_{44}H_{28}N_1Mn^+$	$C_{20}H_8N_1(C_6H_5)_1Mn$ (Manganese, [5,10,15,20-tetraphenyl-21H,23H-porphinato(2-)-N ²¹ ,N ²² ,N ²³ ,N ²⁴]-[SP-4-1]-)	31004-82-7	**	6.44 (V)	PE	4557
$C_{32}H_{16}N_8Mn^+$	$C_{12}H_{16}N_8Mn$ (Manganese, [29H,31H-phthalocyaninato(2-)-N ²⁹ ,N ³⁰ ,N ³¹ ,N ³²]-[SP-4-1]-)	14325-24-7	**	7.26±0.10	EI	3829
$COMn^+$	$((CH_3)_3Si)(CO)_5Mn$	26500-16-3		17.9	EI	3814
$C_2O_2Mn^+$	$(CO)_5MnH$	16972-33-1		13.7	EI	3814
$C_3O_3Mn^+$	$(CO)_5MnH$	16972-33-1		13.2	EI	3814
$C_1O_4Mn^+$	$(CO)_5MnH$	16972-33-1		11.2	EI	3814
$C_{10}O_{10}Mn_2^+$	$(CO)_{10}Mn_2$	10170-69-1	**	8.02 (V)	PE	4492
$CHOMn^+$	$(CO)_5MnH$	16972-33-1	4CO	12.7	EI	3814
$C_6H_5OMn^+$	$C_5H_5(CO)_3Mn$ (Manganese, tricarbonyl(η^5 -2,4-cyclopentadien-1-yl)-)	12079-65-1	2CO	9.28±0.01	EI	4661
$C_7H_7OMn^+$	$C_5H_5(CH_3)(CO)_3Mn$ (Manganese, tricarbonyl[1,2,3,4,5- η]-1-methyl-2,4-cyclopentadien-1-yl)-)	12108-13-3	2CO	9.01±0.03	EI	4661
$C_2HO_2Mn^+$	$(CO)_5MnH$	16972-33-1	3CO	10.3	EI	3814
$C_7H_5O_2Mn^+$	$C_5H_5(CO)_3Mn$ (Manganese, tricarbonyl(η^5 -2,4-cyclopentadien-1-yl)-)	12079-65-1	CO	8.37±0.01	EI	4661
$C_8H_7O_2Mn^+$	$C_5H_5(CH_3)(CO)_3Mn$ (Manganese, tricarbonyl[1,2,3,4,5- η]-1-methyl-2,4-cyclopentadien-1-yl)-)	12108-13-3	CO	8.13±0.01	EI	4661
$C_3HO_3Mn^+$	$(CO)_5MnH$	16972-33-1	2CO	9.9	EI	3814
$C_8H_5O_3Mn^+$	$C_5H_5(CO)_3Mn$ (Manganese, tricarbonyl(η^5 -2,4-cyclopentadien-1-yl)-)	12079-65-1	**	8.05 (V)	PE	4570
			**	8.06±0.01	EI	4661
			**	8.12±0.1	EI	3578
			**	8.12	EI	5453

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₉H₇O₃Mn⁺	C ₉ H ₇ (CO) ₃ Mn (Manganese, tricarbonyl[1,2,3,4,5- η]-2,4-cyclohexadien-1-yl]-)	12108-14-4	**	8.06±0.05 (V)	PE	4501
	C ₉ H ₁₁ (CH ₃)(CO) ₃ Mn (Manganese, tricarbonyl[(1,2,3,4,5- η)-1-methyl-2,4-cyclopentadien-1-yl]-)	12108-13-3	**	~8.1	PE	4995
			**	7.86±0.01	EI	4661
C₁₀H₇O₃Mn⁺	C ₇ H ₇ (CO) ₃ Mn (Manganese, tricarbonyl[(1,2,3,4,5- η)-2,4,6-cycloheptatrien-1-yl]-)	53011-14-6	**	7.78±0.05 (V)	PE	4501
C₁₀H₉O₃Mn⁺	C ₇ H ₉ (CO) ₃ Mn (Manganese, tricarbonyl[1,2,3,4,5- η]-2,4-cycloheptadien-1-yl]-)	32798-86-0	**	7.86±0.05 (V)	PE	4501
C₁HO₁Mn⁺	(CO) ₅ MnH	16972-33-1	CO	8.7	EI	3814
C₅HO₅Mn⁺	(CO) ₅ MnH	16972-33-1	**	8.85 (V)	PE	4448
			**	8.85 (V)	PE	4456
			**	8.5±0.1	EI	3814
C₆H₃O₅Mn⁺	CH ₃ (CO) ₅ Mn	13601-24-6	**	8.65 (V)	PE	4110
C₁₅H₂₁O₆Mn⁺	(CH ₃ COCHCOCH ₃) ₃ Mn (Manganese, tris(2,4-pentanedionato- <i>O,O'</i>)-, (<i>OC</i> -6-11)-)	14284-89-0	**	7.32±0.07 (V)	PE	3682
C₁₆H₁₁N₂O₂Mn⁺	C ₁₆ H ₁₁ N ₂ O ₂ Mn (Manganese, [[2,2'-[1,2-ethanediy]bis(nitrilomethylidyne)] bis[phenolato]](2-)-N,N',O,O']-)	XXXXXX-XX-X	**	7.77±0.08	EI	4668
FMn⁺	MnF	13569-25-0	**	8.51±0.2	EI	3623
	MnF ₂	7782-64-1		13.60±0.2	EI	3623
F₂Mn⁺	MnF ₂	7782-64-1	**	11.38±0.2	EI	3623
	MnF ₃	7783-53-1		14.79±0.2	EI	3623
F₃Mn⁺	MnF ₃	7783-53-1	**	12.57±0.2	EI	3623
	MnF ₄	15195-58-1		15.50±0.2	EI	3623
F₄Mn⁺	MnF ₄	15195-58-1	**	13.46±0.2	EI	3623
O₃FMn⁺	MnO ₃ F	15586-97-7	**	12.20±0.05 (V)	PE	4632
C₆O₅F₃Mn⁺	CF ₃ (CO) ₅ Mn	13601-14-4	**	9.17 (V)	PE	4110
C₁₅H₃O₆F₁₈Mn⁺	(CF ₃ COCHCOCF ₃) ₃ Mn (Manganese, tris(1,1,1,5,5,5-hexafluoro-2,4-pentanedionato- <i>O,O'</i>)-, (<i>OC</i> -6-11)-)	14354-50-8	**	9.2 (V)	PE	3682
C₁₉H₃O₁₀F₁₈Mn⁺	(CF ₃ COCHCOCF ₃) ₃ (CO) ₄ Mn (Tris(1,1,1,5,5,5-hexafluoro-2,4-pentanedionato)manganese tetracarbonyl)	XXXXXX-XX-X	**	8.11±0.07 (V)	PE	3682

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_3H_9SiMn^+$	((CH ₃) ₃ Si)(CO) ₅ Mn	26500-16-3		12.8	EI	3814
$C_7H_9OSiMn^+$	((CH ₃) ₃ Si)(CO) ₅ Mn	26500-16-3	4CO	12.0	EI	3814
	((CH ₃) ₃ Si)(CO) ₄ (PF ₃)Mn	33989-27-4		12.7	EI	3814
$C_3H_9O_2SiMn^+$	((CH ₃) ₃ Si)(CO) ₅ Mn	26500-16-3	3CO	10.8	EI	3814
	((CH ₃) ₃ Si)(CO) ₄ (PF ₃)Mn	33989-27-4		11.1	EI	3814
$C_6H_9O_3SiMn^+$	((CH ₃) ₃ Si)(CO) ₅ Mn	26500-16-3	2CO	10.2	EI	3814
$C_7H_9O_4SiMn^+$	((CH ₃) ₃ Si)(CO) ₅ Mn	26500-16-3	CO	9.2	EI	3814
	((CH ₃) ₃ Si)(CO) ₄ (PF ₃)Mn	33989-27-4	PF ₃	9.9	EI	3814
$C_5H_3O_5SiMn^+$	(SiH ₃)(CO) ₅ Mn	15770-61-3	**	8.99±0.02 (V)	PE	3827
$C_8H_9O_5SiMn^+$	(Si(CH ₃) ₃)(CO) ₅ Mn	XXXXXX-XX-X	**	9.0±0.1 (V)	PE	3827
	((CH ₃) ₃ Si)(CO) ₅ Mn	26500-16-3	**	8.47	PE	5321
			**	8.7±0.2	EI	3814
$C_{24}H_{22}PMn^+$	(CH ₃ C ₅ H ₃)(CO) ₂ ((C ₆ H ₅) ₃ P)Mn	12100-95-7	2CO	8.54±0.03	EI	5576
	(Manganese,dicarbonyl[(1,2,3,4,5-η)-1-methyl-2,4-cyclopentadien-1-yl] (triphenylphosphine)-)					
	C ₂₆ H ₂₂ OPSMn	70279-43-5	CO + CS	9.19±0.03	EI	5576
	(Manganese,(carbonothioyl)carbonyl[(1,2,3,4,5-η)-1-methyl-2,4- cyclopentadien-1-yl](triphenylphosphine)-)					
$C_{25}H_{22}OPMn^+$	(CH ₃ C ₅ H ₃)(CO) ₂ ((C ₆ H ₅) ₃ P)Mn	12100-95-7	CO	8.95±0.02	EI	5576
	(Manganese,dicarbonyl[(1,2,3,4,5-η)-1-methyl-2,4-cyclopentadien-1-yl] (triphenylphosphine)-)					
$C_7H_8O_2PMn^+$	(C ₅ H ₅)(PH ₃)(CO) ₂ Mn	12300-46-8	**	7.28	EI	5453
	(Manganese,dicarbonyl(η ⁵ -2,4-cyclopentadien-1-yl)(phosphine)-)					
$C_{26}H_{22}O_2PMn^+$	(CH ₃ C ₅ H ₃)(CO) ₂ ((C ₆ H ₅) ₃ P)Mn	12100-95-7	**	6.55±0.03	EI	5576
	(Manganese,dicarbonyl[(1,2,3,4,5-η)-1-methyl-2,4-cyclopentadien-1-yl] (triphenylphosphine)-)					
$C_7H_4O_3PMn^+$	C ₄ H ₄ P(CO) ₃ Mn (Phosphacymantrene)	XXXXXX-XX-X	**	8.25 (V)	PE	4995
$C_9H_8O_3PMn^+$	C ₄ H ₂ P(CH ₃) ₂ (CO) ₃ Mn	XXXXXX-XX-X	**	8.13 (V)	PE	4995
	(Phosphacymantrene, 3,4-dimethyl-)					
$C_{11}H_{12}O_3PMn^+$	C ₁₁ H ₁₂ O ₃ PMn	XXXXXX-XX-X	**	8. (V)	PE	4995
	(Phosphacymantrene, 3,4-dimethyl-2-ethyl-)					
$C_{11}H_{10}O_4PMn^+$	C ₁₁ H ₁₀ O ₄ PMn	XXXXXX-XX-X	**	8.2 (V)	PE	4995
	(Phosphacymantrene, 2-acetyl-3,4-dimethyl-)					

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
HF₁₅P₅Mn⁺	H(PF ₃) ₅ Mn	20558-69-4	**	9.47 (V)	PE	4456
C₇H₃O₂F₃PMn⁺	(C ₅ H ₃)(PF ₃)(CO) ₂ Mn (Manganese,dicarbonyl(η^5 -2,4-cyclopentadien-1-yl) (phosphorus trichloride)-)	12275-47-7	**	8.24	EI	5453
C₇H₉O₄F₃SiPMn⁺	((CH ₃) ₃ Si)(CO) ₃ PF ₃ Mn	33989-27-4	**	8.7 ± 0.2	EI	3814
C₆H₉O₃F₆SiP₂Mn⁺	((CH ₃) ₃ Si)(CO) ₄ (PF ₃) ₂ Mn	36087-62-4	**	8.1 ± 0.1	EI	3814
C₅H₉O₂F₉SiP₃Mn⁺	((CH ₃) ₃ Si)(CO) ₃ (PF ₃) ₃ Mn	36087-61-3	**	9.1 ± 0.2	EI	3814
CSMn⁺	C ₅ H ₃ (CO) ₂ CSMn (Manganese, (carbonothioyl)dicarbonyl(η^5 -2,4-cyclopentadien-1-yl)-) C ₅ H ₃ (CH ₃)(CO) ₂ CSMn (Manganese, (carbonothioyl)dicarbonyl[(1,2,3,4,5- η)-1-methyl- 2,4-cyclopentadien-1-yl]-) (C ₅ H ₃)(CS)(NO)MnI (Manganese,(carbonothioyl)(η^5 -2,4-cyclopentadien-1-yl)iodonitrosyl-) (CH ₃ C ₄ H ₇)(CS)(NO)MnI (Manganese,(carbonothioyl)(1,2,3,4,5- η)-1-methyl- 2,4-cyclopentadien-1-yl]iodonitrosyl-)	31741-76-1	2CO + C ₅ H ₃	16.91 ± 0.02	EI	4661
		49716-52-1	2CO + C ₆ H ₇	17.97 ± 0.01	EI	4661
		58450-74-1	C ₅ H ₃ + NO + I	17.74 ± 0.03	EI	5561
		XXXXX-XX-X		18.00 ± 0.05	EI	5561
C₂S₂Mn₂⁺	(C ₅ H ₃) ₂ (CS) ₂ (NO) ₂ Mn ₂ (Manganese,bis[μ -(carbonothioyl)bis(η^5 -2,4-cyclopentadien-1-yl) dinitrosyldi-(Mn-Mn)-)	64090-73-9		20.92 ± 0.04	EI	5423
C₆H₃SMn⁺	C ₅ H ₃ (CO) ₂ CSMn (Manganese, (carbonothioyl)dicarbonyl(η^5 -2,4-cyclopentadien-1-yl)-) (C ₅ H ₃) ₂ (CS) ₂ (NO) ₂ Mn ₂ (Manganese,bis[μ -(carbonothioyl)bis(η^5 -2,4-cyclopentadien-1-yl) dinitrosyldi-(Mn-Mn)-) (C ₅ H ₃)(CS)(NO)MnI (Manganese,(carbonothioyl)(η^5 -2,4-cyclopentadien-1-yl)iodonitrosyl-)	31741-76-1	2CO	9.25 ± 0.01	EI	4661
		64090-73-9		13.00 ± 0.02	EI	5423
		58450-74-1	NO + I	10.17 ± 0.03	EI	5561
C₇H₇SMn⁺	C ₅ H ₃ (CH ₃)(CO) ₂ CSMn (Manganese, (carbonothioyl)dicarbonyl[(1,2,3,4,5- η)-1-methyl- 2,4-cyclopentadien-1-yl]-) C ₂₆ H ₂₂ OPSMn (Manganese,(carbonothioyl)carbonyl[(1,2,3,4,5- η)-1-methyl-2,4- cyclopentadien-1-yl](triphenylphosphine)-) C ₂₆ H ₂₂ OSMnAs (Manganese,(carbonothioyl)carbonyl[(1,2,3,4,5- η)-1- methyl-2,4-cyclopentadien-1-yl](triphenylarsine)-) (CH ₃ C ₄ H ₇)(CO)(CS)((C ₆ H ₅) ₃ Sb)Mn (Manganese,(carbonothioyl)carbonyl[(1,2,3,4,5- η)-1-methyl- 2,4-cyclopentadien-1-yl](triphenylstibine)-) (CH ₃ C ₄ H ₇)(CS)(NO)MnI (Manganese,(carbonothioyl)(1,2,3,4,5- η)-1-methyl- 2,4-cyclopentadien-1-yl]iodonitrosyl-)	49716-52-1	2CO	9.15 ± 0.01	EI	4661
		70279-43-5	CO + (C ₆ H ₅) ₃ P	12.54 ± 0.50	EI	5576
		XXXXX-XX-X		11.78 ± 0.30	EI	5576
		XXXXX-XX-X		10.78 ± 0.08	EI	5576
		XXXXX-XX-X	NO + I	10.21 ± 0.03	EI	5561
C₁₀H₁₅SMn⁺	C ₄ H ₉ SC ₄ H ₇ CH ₃ Mn(CO) ₂ (Dicarbonyl[(1,2,3,4,5-)-1-methyl-2,4-cyclopentadien-1-yl] (tetrahydrothiophene)manganese)	12153-94-5	2CO	7.9 ± 0.1	EI	3498

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{18}H_{17}SMn^+$	$(C_6H_5)_2SC_5H_4CH_3Mn(CO)_2$ (Dicarbonyl(1,2,3,4,5-)-1-methyl-2,4-cyclopentadien-1-yl) (1,1'-thiobis(benzene)-S)manganese)	36154-47-9	2CO	8.0 ± 0.1	EI	3498
$C_7H_4S_2Mn^+$	$(C_5H_5)_2(CS)_2(NO)_2Mn_2$ (Manganese,bis[μ -(carbonothioyl)bis(η^5 -2,4-cyclopentadien-1-yl) dinitrosyldi-(Mn-Mn)-)	64090-73-9		15.61 ± 0.16	EI	5423
$C_7H_5S_2Mn^+$	$(C_5H_5)_2(CS)_2(NO)_2Mn_2$ (Manganese,bis[μ -(carbonothioyl)bis(η^5 -2,4-cyclopentadien-1-yl) dinitrosyldi-(Mn-Mn)-)	64090-73-9		16.02 ± 0.05	EI	5423
$C_6H_5SMn_2^+$	$(C_5H_5)_2(CS)_2(NO)_2Mn_2$ (Manganese,bis[μ -(carbonothioyl)bis(η^5 -2,4-cyclopentadien-1-yl) dinitrosyldi-(Mn-Mn))	64090-73-9		16.18 ± 0.07	EI	5423
$C_{11}H_{10}SMn_2^+$	$(C_5H_5)_2(CS)_2(NO)_2Mn_2$ (Manganese,bis[μ -(carbonothioyl)bis(η^5 -2,4-cyclopentadien-1-yl) dinitrosyldi-(Mn-Mn))	64090-73-9	CS + 2NO	12.64 ± 0.02	EI	5423
$C_7H_4S_2Mn_2^+$	$(C_5H_5)_2(CS)_2(NO)_2Mn_2$ (Manganese,bis[μ -(carbonothioyl)bis(η^5 -2,4-cyclopentadien-1-yl) dinitrosyldi-(Mn-Mn)-)	64090-73-9		11.87 ± 0.03	EI	5423
$C_7H_5S_2Mn_2^+$	$(C_5H_5)_2(CS)_2(NO)_2Mn_2$ (Manganese,bis[μ -(carbonothioyl)bis(η^5 -2,4-cyclopentadien-1-yl) dinitrosyldi-(Mn-Mn))	64090-73-9	$C_5H_5 + 2NO$	12.89 ± 0.02	EI	5423
$C_{12}H_{10}S_2Mn_2^+$	$(C_5H_5)_2(CS)_2(NO)_2Mn_2$ (Manganese,bis[μ -(carbonothioyl)bis(η^5 -2,4-cyclopentadien-1-yl) dinitrosyldi-(Mn-Mn))	64090-73-9	2NO	8.99 ± 0.02	EI	5423
$C_7H_5OSMn^+$	$C_5H_5(CO)_2CSMn$ (Manganese, (carbonothioyl)dicarbonyl(η^5 -2,4-cyclopentadien-1-yl)-)	31741-76-1	CO	8.18 ± 0.01	EI	4661
$C_8H_7OSMn^+$	$C_5H_4(CH_3)(CO)_2CSMn$ (Manganese, (carbonothioyl)dicarbonyl[(1,2,3,4,5- η)-1-methyl- 2,4-cyclopentadien-1-yl]-)	49716-52-1	CO	7.95 ± 0.02	EI	4661
$C_8H_{13}OSMn^+$	$C_5H_4CH_3Mn(CO)_2SO(CH_3)_2$ (Dicarbonyl(1,2,3,4,5-)-1-methyl-2,4-cyclopentadien-1-yl) (sulfinylbis(methane)-S)manganese)	12153-02-5	2CO	7.9 ± 0.1	EI	3498
$C_{10}H_{15}OSMn^+$	$C_4H_9SOC_5H_4CH_3Mn(CO)_2$ (Dicarbonyl(1,2,3,4,5-)-1-methyl-2,4-cyclopentadiene-1-yl) (tetrahydrothiophene 1-oxide-S)manganese)	12153-95-6	2CO	7.5 ± 0.1	EI	3498
$C_{18}H_{17}OSMn^+$	$(C_6H_5)_2SOC_5H_4CH_3Mn(CO)_2$ (Dicarbonyl(1,2,3,4,5- η)-1-methyl-2,4-cyclopentadien-1-yl) (1,1'-sulfinylbis(benzene)-S)manganese)	36154-49-1	2CO	7.8 ± 0.1	EI	3498

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_8H_5O_2SMn^+$	$(C_5H_5)(CO)_2(CS)Mn$	31741-76-1	**	7.81 (V)	PE	5518
	(Manganese,(carbonothioyl)dicarbonyl(η^5 -2,4-cyclopentadien-1-yl)-)		**	7.78 ± 0.01	EI	4661
$C_9H_7O_2SMn^+$	$C_5H_4(CH_3)(CO)_2CSMn$	49716-52-1	**	7.72 ± 0.02	EI	4661
	(Manganese, (carbonothioyl)dicarbonyl[(1,2,3,4,5- η)-1-methyl-2,4-cyclopentadien-1-yl]-)					
$C_{12}H_{15}O_2SMn^+$	$C_1H_8SC_5H_4CH_3Mn(CO)_2$	12153-94-5	**	6.45 ± 0.05	EI	3498
	(Dicarbonyl(1,2,3,4,5- η)-1-methyl-2,4-cyclopentadien-1-yl)(tetrahydrothiophene)manganese)		**	6.45	EI	5292
$C_{20}H_{17}O_2SMn^+$	$(C_6H_5)_2SC_5H_4CH_3Mn(CO)_2$	36154-47-9	**	6.27 ± 0.05	EI	3498
	(Dicarbonyl((1,2,3,4,5- η)-1-methyl-2,4-cyclopentadien-1-yl)(1,1'-thiobis(benzene)-S)manganese)		**	6.27	EI	5292
$C_8H_{11}O_3SMn^+$	$C_2H_4O_2SOC_5H_4CH_3Mn(CO)_2$	12152-97-5	2CO	7.75 ± 0.1	EI	3498
	(Dicarbonyl(1,3,2-dioxathiolane 2-oxide-S)((1,2,3,4,5- η)-1-methyl-2,4-cyclopentadien-1-yl)manganese)					
$C_{10}H_{13}O_3SMn^+$	$C_5H_4CH_3Mn(CO)_2SO(CH_3)_2$	12153-02-5	**	7.19 ± 0.05	EI	3498
	(Dicarbonyl((1,2,3,4,5- η)-1-methyl-2,4-cyclopentadien-1-yl)(sulfinylbis(methane)-S)manganese)		**	7.19	EI	5292
$C_{12}H_{15}O_3SMn^+$	$C_4H_8SOC_5H_4CH_3Mn(CO)_2$	12153-95-6	**	6.79 ± 0.05	EI	3498
	(Dicarbonyl((1,2,3,4,5- η)-1-methyl-2,4-cyclopentadiene-1-yl)(tetrahydrothiophene 1-oxide-S)manganese hydrothiophene-1-oxide-S-))		**	6.79	EI	5292
$C_{20}H_{17}O_3SMn^+$	$(C_6H_5)_2SOC_5H_4CH_3Mn(CO)_2$	36154-49-1	**	6.76 ± 0.05	EI	3498
	(Dicarbonyl((1,2,3,4,5- η)-1-methyl-2,4-cyclopentadien-1-yl)(1,1'-sulfinylbis(benzene)-S)manganese)		**	6.76	EI	5292
$C_{10}H_{11}O_5SMn^+$	$C_2H_4O_2SOC_5H_4CH_3Mn(CO)_2$	12152-97-5	**	7.38 ± 0.05	EI	3498
	(Dicarbonyl(1,3,2-dioxathiolane 2-oxide-S)((1,2,3,4,5- η)-1-methyl-2,4-cyclopentadien-1-yl)manganese)		**	7.38	EI	5292
$C_6H_5NOSMn^+$	$(C_5H_5)_2(CS)_2(NO)_2Mn_2$	64090-73-9		11.04 ± 0.03	EI	5423
	(Manganese,bis[μ -(carbonothioyl)bis(η^5 -2,4-cyclopentadien-1-yl)dinitrosyl-di-(<i>Mn-Mn</i>)-)					
$C_7H_7NOSMn^+$	$(C_5H_5)(CS)(NO)MnI$	58450-74-1	1	8.77 ± 0.04	EI	5561
	(Manganese,(carbonothioyl)(η^5 -2,4-cyclopentadien-1-yl)iodonitrosyl-)					
$C_7H_7NOSMn^+$	$(CH_3C_5H_4)(CS)(NO)MnI$	XXXXX-XX-X 1		8.68 ± 0.02	EI	5561
	(Manganese,(carbonothioyl)(1,2,3,4,5- η)-1-methyl-2,4-cyclopentadien-1-yl)iodonitrosyl-)					

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_7H_5NOS_2Mn^+$	$(C_5H_5)_2(CS)_2(NO)_2Mn_2$ (Manganese,bis[μ -(carbonothioyl)bis(η^5 -2,4-cyclopentadien-1-yl) dinitrosylid-(<i>Mn-Mn</i>))	64090-73-9		9.03 ± 0.04	EI	5423
$C_7H_5NOS_2Mn_2^+$	$(C_5H_5)_2(CS)_2(NO)_2Mn_2$ (Manganese,bis[μ -(carbonothioyl)bis(η^5 -2,4-cyclopentadien-1-yl) dinitrosylid-(<i>Mn-Mn</i>))	64090-73-9	$C_5H_5 + NO$	11.97 ± 0.02	EI	5423
$C_{12}H_{10}NOS_2Mn_2^+$	$(C_5H_5)_2(CS)_2(NO)_2Mn_2$ (Manganese,bis[μ -(carbonothioyl)bis(η^5 -2,4-cyclopentadien-1-yl) dinitrosylid-(<i>Mn-Mn</i>))	64090-73-9	NO	7.90 ± 0.02	EI	5423
$C_{12}H_{10}N_2O_2S_2Mn^+$	$(C_5H_5)_2(CS)_2(NO)_2Mn_2$ (Manganese,bis[μ -(carbonothioyl)bis(η^5 -2,4-cyclopentadien-1-yl) dinitrosylid-(<i>Mn-Mn</i>)-)	64090-73-9	**	6.77 ± 0.02	EI	5582
$C_{25}H_{22}PSMn^+$	$C_{26}H_{22}OPSMn$ (Manganese,(carbonothioyl)carbonyl[(1,2,3,4,5- η)-1-methyl-2,4- cyclopentadien-1-yl](triphenylphosphine)-)	70279-43-5	CO	7.37 ± 0.02	EI	5576
$C_{26}H_{22}OPSMn^+$	$C_{26}H_{22}OPSMn$ (Manganese,(carbonothioyl)carbonyl[(1,2,3,4,5- η)-1-methyl-2,4- cyclopentadien-1-yl](triphenylphosphine)-)	70279-43-5	**	6.58 ± 0.02	EI	5576
Cl_2Mn^+	$MnCl_2$	7773-01-5	**	11.03 (V)	PE	5172
$C_{44}H_{28}N_4ClMn^+$	$C_{20}H_8N_4(C_6H_5)_4MnCl$ (Manganese, chloro[5,10,15,20-tetraphenyl-21H,23H-porphinato(2-)- $N^{21},N^{22},N^{23},N^{24}$]- (SP-5-12)-)	32195-55-4	**	5.95 ± 0.2	OTH	4962
O_3ClMn^+	MnO_3Cl	15605-27-3	**	11.98 ± 0.05 (V)	PE	4632
$C_5O_3ClMn^+$	$(CO)_3MnCl$	14100-30-2	** **	8.87 ± 0.05 (V) 8.94 (V)	PE PE	4492 3866
$C_5O_3SiCl_3Mn^+$	$(CO)_3SiCl_3Mn$	38194-30-8	**	9.36 ± 0.05	PE	4492
$C_7H_5O_2PCl_3Mn^+$	$(C_5H_5)(PCl_3)(CO)_2Mn$ (Manganese,dicarbonyl(η^5 -2,4-cyclopentadien-1-yl) (phosphorus trichloride)-)	12275-46-6	**	8.12	EI	5453
Fe^+	Fe	7439-89-6	** **	7.7 ± 0.2 8.0 ± 0.5	EI EI	4618 4436
	$(C_5H_5)_2Fe$ (Ferrocene)	102-54-5		12.0 ± 1.5	EI	3793
			$(C_5H_5)_2$	14.00 ± 0.25	EI	3623
				14.10 ± 0.15	EI	4072
	$(CO)_5Fe$	13463-40-6	5CO	16.2 ± 0.2	EI	4618

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
Fe^+	(((CH ₃) ₂ N) ₃ P)(CO) ₃ Fe	19372-47-5		17.0±0.05	EI	3952
	(C ₅ H ₅) ₂ (CS)(CO) ₃ Fe ₂	67113-80-8		20.94±0.03	EI	5423
	(Iron,μ-carbonothioyl-μ-carbonyldicarbonylbis(η ⁵ -2,4-cyclopentadien-1-yl)di-(Fe-Fe)-)					
	(C ₅ H ₅) ₂ (CS) ₂ (CO) ₂ Fe ₂	67225-86-9		20.21±0.03	EI	5423
	(Iron,bis[μ-(carbonothioyl)]dicarbonylbis(η ⁵ -2,4-cyclopentadien-1-yl)di-(Fe-Fe)-)					
Fe^{2+}	Fe ⁺	7439-89-6	**	16.188±0.001	S	5233
Fe_2^+	(C ₅ H ₅) ₂ (CS)(CO) ₃ Fe ₂	67113-80-8		26.71±0.06	EI	5423
	(Iron,μ-carbonothioyl-μ-carbonyldicarbonylbis(η ⁵ -2,4-cyclopentadien-1-yl)di-(Fe-Fe)-)					
	(C ₅ H ₅) ₂ (CS) ₂ (CO) ₂ Fe ₂	67225-86-9		20.89±0.03	EI	5423
	(Iron,bis[μ-(carbonothioyl)]dicarbonylbis(η ⁵ -2,4-cyclopentadien-1-yl)di-(Fe-Fe)-)					
C_2Fe^+	(CO) ₅ Fe	13463-40-6		29.9±0.5	EI	4736
$\text{C}_3\text{H}_3\text{Fe}^+$	(C ₅ H ₅) ₂ Fe (Ferrocene)	102-54-5		17.75±0.2	EI	4072
				18.06±0.10	EI	3628
$\text{C}_5\text{H}_5\text{Fe}^+$	(C ₅ H ₅) ₂ Fe (Ferrocene)	102-54-5		12.95±0.15	EI	4072
			C_5H_5	13.9±0.2	EI	3793
				14.25±0.25	EI	3628
	(C ₅ H ₅) ₂ (CS)(CO) ₃ Fe ₂	67113-80-8		15.82±0.03	EI	5423
	(Iron,μ-carbonothioyl-μ-carbonyldicarbonylbis(η ⁵ -2,4-cyclopentadien-1-yl)di-(Fe-Fe)-)					
	(C ₅ H ₅) ₂ (CS) ₂ (CO) ₂ Fe ₂	67225-86-9		15.32±0.03	EI	5423
	(Iron,bis[μ-(carbonothioyl)]dicarbonylbis(η ⁵ -2,4-cyclopentadien-1-yl)di-(Fe-Fe)-)					
$\text{C}_{10}\text{H}_{10}\text{Fe}^+$	(C ₅ H ₅) ₂ Fe (Ferrocene)	102-54-5	**	6.90 (V)	PE	4565
			**	6.78±0.05	PI	3729
			**	6.72	PE	3725
			**	6.86 (V)	PE	5394
			**	6.88 (V)	PE	3688
			**	6.88 (V)	PE	5507
			**	~7.0 (V)	PE	3527
			**	7.10 (V)	PE	4072
			**	6.75±0.25	EI	3628
			**	6.9±0.1	EI	3793
			**	6.90±0.1	EI	4072
	(C ₅ H ₅) ₂ (CS)(CO) ₃ Fe ₂	67113-80-8		9.03±0.03	EI	5423
	(Iron,μ-carbonothioyl-μ-carbonyldicarbonylbis(η ⁵ -2,4-cyclopentadien-1-yl)di-(Fe-Fe)-)					
	(C ₅ H ₅) ₂ (CS) ₂ (CO) ₂ Fe ₂	67225-86-9		8.62±0.03	EI	5423
	(Iron,bis[μ-(carbonothioyl)]dicarbonylbis(η ⁵ -2,4-cyclopentadien-1-yl)di-(Fe-Fe)-)					
$\text{C}_{12}\text{H}_{12}\text{Fe}^+$	(C ₅ H ₅)(C ₅ H ₄ C ₂ H ₃)Fe (Ferrocene, ethenyl-)	1271-51-8	**	6.75±0.05	PI	3729

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{12}H_{11}Fe^+$	$(C_5H_5CH_3)_2Fe$ (Ferrocene, 1,1'-dimethyl-)	1291-47-0	**	6.72 (V)	PE	3688
			**	6.72 (V)	PE	5507
	$(C_5H_5)(C_5H_4C_2H_5)Fe$ (Ferrocene, ethyl-)	1273-89-8	**	6.70 ± 0.05	PI	3729
$C_{20}H_{30}Fe^+$	$(C_5(CH_3)_2)_2Fe$ (Ferrocene, decamethyl-)	12126-50-0	**	5.88 (V)	PE	5394
$C_{20}H_{16}Fe_2^+$	$(C_{10}H_8)_2Fe_2$ (1,1':1'',1'''-Biferrocene)	11105-90-1	**	6.55 (V)	PE	5373
$C_{20}H_{18}Fe_2^+$	$(C_{10}H_8)(C_5H_5)_2Fe_2$ (1,1''-Biferrocene)	1287-38-3	**	6.6 (V)	PE	5373
$C_{36}H_{41}N_4Fe^+$	$((C_5H_5)_2C_4NCH)_4Fe$ (Iron, [2,3,7,8,12,13,17,18-octaethyl-21H,23H-porphinato(2-)- $N^{21},N^{22},N^{23},N^{24}$](SP-4-1)-)	61085-06-1	**	6.06 ± 0.03 (V)	PE	5476
$C_{44}H_{28}N_4Fe^+$	$C_{20}H_8N_4(C_6H_5)_4Fe$ (Iron, [5,10,15,20-tetraphenyl-21H,23H-porphinato(2-)- $N^{21},N^{22},N^{23},N^{24}$](SP-4-1)-)	16591-56-3	**	6.50 (V)	PE	4557
$C_{32}H_{16}N_8Fe^+$	$C_{32}H_{16}N_8Fe$ (Iron, [29H,31H-phthalocyaninato(2-)- $N^{20},N^{30},N^{31},N^{32}$](SP-4-1)-)	132-16-1	**	7.22 ± 0.10	EI	3829
OFe^+	FeO	1345-25-1	**	8.71 ± 0.10	EI	4436
	$(CO)_5Fe$	13463-40-6		22.5 ± 0.5	EI	4736
O_2Fe^+	FeO_2	12411-15-3	**	9.5 ± 0.5	EI	4436
$COFe^+$	$(CO)_5Fe$	13463-40-6	4CO	14.0 ± 0.2	EI	4618
C_2OFe^+	$(CO)_5Fe$	13463-40-6		20.2 ± 0.5	EI	4736
$C_2O_2Fe^+$	$(CO)_5Fe$	13463-40-6	3CO	11.0 ± 0.2	EI	4618
$C_3O_2Fe^+$	$(CO)_5Fe$	13463-40-6		18.2 ± 0.5	EI	4736
$C_3O_3Fe^+$	$(CO)_5Fe$	13463-40-6	2CO	10.1 ± 0.2	EI	4618
$C_3O_3Fe^{+2}$	$(CO)_5Fe$	13463-40-6		24.0 ± 0.5	EI	4736
$C_4O_4Fe^+$	$(CO)_5Fe$	13463-40-6	CO	9.3 ± 0.2	EI	4618
$C_5O_5Fe^+$	$(CO)_5Fe$	13463-40-6	**	8.6 (V)	PE	4376

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₃O₃Fe⁺	(CO) ₃ Fe	13463-40-6	**	8.60 (V)	PE	4456
			**	8.4±0.2	EI	4618
C₈H₈O₂Fe⁺	C ₅ H ₃ (CO) ₂ (CH ₃)Fe (Iron, dicarbonyl(η ⁵ -2,4-cyclopentadien-1-yl)methyl-)	12080-06-7	**	7.65 (V)	PE	4565
			**	7.79 (V)	PE	4570
			**	7.91 (V)	PE	5358
C₁₀H₁₀O₂Fe⁺	(C ₅ H ₃)(C ₃ H ₃)(CO) ₂ Fe (Iron,dicarbonyl(η ⁵ -2,4-cyclopentadien-1-yl)-2-propenyl-)	38960-10-0	**	7.97 (V)	PE	5358
C₁₂H₁₀O₂Fe⁺	(C ₅ H ₃) ₂ (CO) ₂ Fe (Iron,dicarbonyl-2,4-cyclopentadiene-1-yl(η ⁵ -2,4-cyclopentadien-1-yl)-)	12247-96-0	**	7.58 (V)	PE	5358
C₇H₄O₃Fe⁺	C ₄ H ₄ (CO) ₃ Fe (Iron, tricarbonyl(η ⁴ -1,3-cyclobutadiene)-)	12078-17-0	**	7.65±0.02	PE	4412
			**	8.1 (V)	PE	4937
			**	8.15 (V)	PE	5005
C₇H₆O₃Fe⁺	(CH ₂ =CHCH=CH ₂)(CO) ₃ Fe (1,3- <i>n</i> -C ₄ H ₆)(CO) ₃ Fe (Iron, (η ⁴ -1,3-butadiene)tricarbonyl-) (CH ₂) ₃ C(CO) ₃ Fe (Trimethylenemethane-iron tricarbonyl-)	12078-32-9 52610-59-0 XXXXX-XX-X	**	8.16 (V)	PE	5551
			**	8.23 (V)	PE	5044
			**	8.22 (V)	PE	5005
			**	8.63 (V)	PE	5005
C₈H₈O₃Fe⁺	C ₆ H ₆ O ₃ Fe (Iron, tricarbonyl[(1,2,3,4-η)-2-methyl-1,3-butadiene]-, stereoisomer) C ₆ H ₆ O ₃ Fe (Iron, tricarbonyl[(1,2,3,4-η)-1,3-pentadiene]-,(E)-)	32731-93-4 XXXXX-XX-X	**	8.11 (V)	PE	5005
			**	8.07 (V)	PE	5005
C₉H₈O₃Fe⁺	C ₆ H ₆ (CO) ₃ Fe (Iron, tricarbonyl[(1,2,3,4-η)-1,3-cyclohexadiene]-)	12152-72-6	**	7.96 (V)	PE	5005
			**	7.98 (V)	PE	5551
C₉H₁₀O₃Fe⁺	C ₉ H ₁₀ O ₃ Fe (Iron, tricarbonyl[(1,2,3,4-η)-2,3-dimethyl-1,3-butadiene]-) C ₉ H ₁₀ O ₃ Fe (Iron, tricarbonyl[(1,2,3,4-η)-2-methyl-1,3-pentadiene-,(E)-])	31741-56-7 XXXXX-XX-X	**	7.95 (V)	PE	5005
			**	7.94 (V)	PE	5005
C₁₀H₈O₃Fe⁺	C ₇ H ₆ (CO) ₃ Fe (Iron, [(2,3,5,6-η)-bicyclo 2.2.1]hepta-2,5-diene] tricarbonyl-) (C ₇ H ₆)(CO) ₃ Fe (Iron,tricarbonyl[(1,2,3,4-η)-1,3,5-cycloheptatriene]-)	12307-07-2 36343-88-1	**	7.51 (V)	PE	5005
			**	7.51 (V)	PE	5367
			**	7.76 (V)	PE	5551
C₁₀H₁₀O₃Fe⁺	(C ₇ H ₁₀)(CO) ₃ Fe (Iron,tricarbonyl[(1,2,3,4-η)-1,3-cycloheptadiene]-)	40674-86-0	**	7.78 (V)	PE	5551

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{11}H_8O_3Fe^+$	(C ₉ H ₈)(CO) ₃ Fe (Iron, tricarbonyl[(1,2,3,4- η)-1,3,5,7-cyclooctatetraene]-)	12093-05-9	**	7.84 (V)	PE	5551
$C_{11}H_{12}O_3Fe^+$	(C ₉ H ₁₂)(CO) ₃ Fe (Iron, tricarbonyl[(1,2,3,4- η)-1,3-cyclooctadiene]-)	33270-50-7	**	7.45 (V)	PE	5551
$C_1H_2O_1Fe^+$	Fe(CO) ₃ H ₂	12002-28-7	**	9.65	PE	4372
$C_6H_1O_1Fe^+$	(CH ₂ =CH ₂)(CO) ₃ Fe	32799-25-0	** **	8.38 (V) 8.4-8.6 (V)	PE PE	4946 4376
$C_{11}H_{12}O_1Fe^+$	(C ₅ (CH ₃) ₄)(CO) ₃ Fe	12264-26-5	**	7.84 (V)	PE	5362
$C_7H_1O_3Fe^+$	CH ₂ =CHCHO(CO) ₃ Fe	12287-43-3	** **	8.69 (V) 9.35 (V)	PE PE	4908 5559
$C_8H_6O_3Fe^+$	CH ₃ CH=CHCHO(CO) ₃ Fe	70520-16-0	**	8.60 (V)	PE	4908
$C_{11}H_{12}O_3Fe^+$	C ₁₁ H ₁₂ O ₃ Fe (Iron, tricarbonyl[(1,2,3,4- η)-(2,4-hexadienoic acid ethyl ester, (E,E)-)-])	XXXXX-XX-X	**	8.19 (V)	PE	5005
$C_7H_3O_6Fe^+$	CH ₂ =CHCOO(CO) ₃ Fe	12287-44-4	**	8.66 (V)	PE	4908
$C_8H_6O_6Fe^+$	CH ₂ =CHCOOCH ₃ (CO) ₃ Fe	12287-67-1	**	8.50 (V)	PE	4908
$C_{15}H_{21}O_6Fe^+$	(CH ₃ COCHCOCH ₃) ₃ Fe (Iron, tris(2,4-pentanedionato- <i>O,O'</i>)-, (<i>OC</i> -6-11)-)	14024-18-1	**	8.10 ± 0.07 (V)	PE	3682
$C_{33}H_{57}O_6Fe^+$	((CH ₃) ₄ CCOCHCOCH(CH ₃) ₄) ₃ Fe (Iron, tris(2,2,6,6-tetramethyl-3,5-heptanedionato- <i>O,O'</i>)-)	14876-47-2	**	7.92 ± 0.07 (V)	PE	3682
$C_{10}H_8O_8Fe^+$	CH ₃ OOCC=CHCOOCH ₃ (CO) ₃ Fe	33248-78-1	**	8.68 (V)	PE	4908
$C_{11}H_{10}O_1Fe_2^+$	<i>trans</i> -((C ₅ H ₅)(CO) ₂ Fe) ₂ (Iron, di- μ -carbonyldicarbonylbis(η^5 -2,4-cyclopentadien-1-yl) di-(Fe-Fe))	32757-46-3	**	6.95 (V)	PE	5317
$C_{21}H_{20}O_1Fe_4^+$	(C ₅ H ₅ COFe) ₄ (Iron, tetra- μ -3-carbonyltetrakis(η^5 -2,4-cyclopentadien-1-yl)tetra-tetrahedro)	12203-87-1	**	6.45 (V)	PE	4565
$B_1C_3H_8O_3Fe^+$	B ₁ H ₉ (CO) ₃ Fe (Iron, tricarbonyl[(1,2,3,4- η)-tetraborane(8)]-)	54748-47-9	**	8.6 (V)	PE	4937
$B_3C_3H_9O_3Fe^+$	B ₃ H ₉ (CO) ₃ Fe (Iron, tricarbonyl [nonahydropentaborate (2-)]-)	61403-41-6	**	8.4 (V)	PE	4937

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
B₃C₅H₅O₃Fe⁺	C ₂ H ₅ B ₃ (CO) ₃ Fe (Iron, tricarbonyl [η^1 -pentahydrodicarbapentaborato(2-)]-)	53363-10-3	**	8.6 (V)	PE	4937
B₃C₅H₇O₃Fe⁺	C ₂ H ₇ B ₃ (CO) ₃ Fe (Iron, tricarbonyl [(1,2,3,4,5- η)-heptahydro-1,2-dicarbapentaborate (2-)]-)	36657-30-4	**	8.7	PE	4937
B₅C₅H₃O₅Fe⁺	B ₅ H ₃ (CO) ₅ Fe (Iron, tricarbonyl [(2,3,4,5- η)-dicarbonyltrihidropentaborato (2-)]-)	61525-93-7	**	8.0 (V)	PE	4937
C₂N₂O₄Fe⁺	(CO) ₂ (NO) ₂ Fe	13682-74-1	**	8.16±0.04	PE	5225
C₇H₃NO₄Fe⁺	(CH ₂ =CHCN)(CO) ₄ Fe	15602-77-4	**	8.90 (V)	PE	5559
C₅H₅NO₄Fe⁺	(C ₅ H ₅ N)(CO) ₄ Fe (Iron, tetracarbonyl(pyridine)-(TB-5-12)-)	53317-88-7	**	7.65 (V)	PE	5559
C₁₅H₁₂O₆F₉Fe⁺	(CF ₃ COCHCOCH ₃) ₃ Fe (Iron, tris(1,1,1-trifluoro-2,4-pentanedionato- <i>O,O'</i>)-)	14526-22-8	**	9.18±0.07 (V)	PE	3682
C₁₅H₃O₆F₁₈Fe⁺	(CF ₃ COCHCOCF ₃) ₃ Fe (Iron, tris(1,1,1,5,5,5-hexafluoro-2,4-pentanedionato- <i>O,O'</i>)-, (<i>OC</i> -6-11)-)	17786-67-3	**	10.13±0.07 (V)	PE	3682
C₁₃H₁₈SiFe⁺	(C ₅ H ₅)(C ₅ H ₄ Si(CH ₃) ₃)Fe (Ferrocene, (trimethylsilyl)-)	12215-68-8	**	9.5±0.10	PI	3729
C₆H₁₈N₃PFe⁺	(((CH ₃) ₂ N) ₃ P)(CO) ₄ Fe	19372-47-5	4CO	10.2±0.05	EI	3952
C₁₂H₃₆N₆P₂Fe⁺	(((CH ₃) ₂ N) ₃ P) ₂ (CO) ₃ Fe	19372-46-4	3CO	11.7±0.05	EI	3952
C₇H₉O₄PFe⁺	(P(CH ₃) ₃)(CO) ₄ Fe (JC-Mean value of Jahn-Teller components)	18475-02-0	**	7.77 (V)	PE	5559
C₂₂H₁₅O₄PFe⁺	(P(C ₆ H ₅) ₃)(CO) ₄ Fe (Iron, tetracarbonyl(triphenylphosphine)-)	14649-69-5	**	7.55 (V)	PE	5559
C₇H₁₈N₃OPFe⁺	(((CH ₃) ₂ N) ₃ P)(CO) ₄ Fe	19372-47-5	3CO	10.2±0.05	EI	3952
C₈H₁₈N₃O₂PFe⁺	(((CH ₃) ₂ N) ₃ P)(CO) ₄ Fe	19372-47-5	2CO	9.8±0.05	EI	3952
C₉H₁₈N₃O₃PFe⁺	(((CH ₃) ₂ N) ₃ P)(CO) ₄ Fe	19372-47-5	CO	9.4±0.05	EI	3952
C₁₀H₁₈N₃O₄PFe⁺	(((CH ₃) ₂ N) ₃ P)(CO) ₄ Fe	19372-47-5	**	9.0±0.05	EI	3952

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{13}H_{36}N_6OP_2Fe^+$	(((CH ₃) ₂ N) ₃ P) ₂ (CO) ₃ Fe	19372-46-4	2CO	10.2±0.05	EI	3952
$C_{11}H_{36}N_6O_2P_2Fe^+$	(((CH ₃) ₂ N) ₃ P) ₂ (CO) ₃ Fe	19372-46-4	CO	9.7±0.05	EI	3952
$C_{15}H_{36}N_6O_3P_2Fe^+$	(((CH ₃) ₂ N) ₃ P) ₂ (CO) ₃ Fe	19372-46-4	**	7.7±0.05	EI	3952
$F_{13}P_5Fe^+$	(PF ₃) ₅ Fe	13815-34-4	**	8.9	PE	4021
			**	9.15 (V)	PE	4456
			**	8.83	EI	5453
$H_2F_{12}P_1Fe^+$	FeH ₂ (PF ₃) ₄	24899-55-6	**	9.78 (V)	PE	4720
$C_1O_1F_3PFe^+$	PF ₃ Fe(CO) ₄	16388-47-9	**	8.75 (V)	PE	4753
$C_3O_3F_6P_2Fe^+$	(PF ₃) ₂ Fe(CO) ₃	16454-87-8	**	8.95 (V)	PE	4753
			**	8.47	EI	5453
$C_2O_2F_9P_3Fe^+$	(PF ₃) ₃ (CO) ₂ Fe	16388-46-8	**	8.61	EI	5453
$COF_{12}P_1Fe^+$	(PF ₃) ₄ FeCO	16388-45-7	**	9.18 (V)	PE	4753
			**	8.62	EI	5453
$CSFe^+$	(C ₅ H ₅) ₂ (CS)(CO) ₃ Fe ₂ (Iron,μ-carbonothioyl-μ-carbonyldicarbonylbis(η ⁵ -2,4-cyclopentadien-1-yl)di-(Fe-Fe)-)	67113-80-8		11.88±0.03	EI	5423
	(C ₅ H ₅) ₂ (CS) ₂ (CO) ₂ Fe ₂ (Iron,bis[μ-(carbonothioyl)]dicarbonylbis(η ⁵ -2,4-cyclopentadien-1-yl)di-(Fe-Fe)-)	67225-86-9		12.02±0.06	EI	5423
$CSFe_2^+$	(C ₅ H ₅) ₂ (CS)(CO) ₃ Fe ₂ (Iron,μ-carbonothioyl-μ-carbonyldicarbonylbis(η ⁵ -2,4-cyclopentadien-1-yl)di-(Fe-Fe)-)	67113-80-8		26.00±0.03	EI	5423
	(C ₅ H ₅) ₂ (CS) ₂ (CO) ₂ Fe ₂ (Iron,bis[μ-(carbonothioyl)]dicarbonylbis(η ⁵ -2,4-cyclopentadien-1-yl)di-(Fe-Fe)-)	67225-86-9		20.00±0.03	EI	5423
$C_2S_2Fe_2^+$	(C ₅ H ₅) ₂ (CS)(CO) ₃ Fe ₂ (Iron,μ-carbonothioyl-μ-carbonyldicarbonylbis(η ⁵ -2,4-cyclopentadien-1-yl)di-(Fe-Fe)-)	67113-80-8		26.00±0.03	EI	5582
	(C ₅ H ₅) ₂ (CS) ₂ (CO) ₂ Fe ₂ (Iron,bis[μ-(carbonothioyl)]dicarbonylbis(η ⁵ -2,4-cyclopentadien-1-yl)di-(Fe-Fe)-)	67225-86-9		22.53±0.03	EI	5423
$C_6H_5SFe^+$	(C ₅ H ₅) ₂ (CS)(CO) ₃ Fe ₂ (Iron,μ-carbonothioyl-μ-carbonyldicarbonylbis(η ⁵ -2,4-cyclopentadien-1-yl)di-(Fe-Fe)-)	67113-80-8		14.74±0.04	EI	5423
	(C ₅ H ₅) ₂ (CS) ₂ (CO) ₂ Fe ₂ (Iron,bis[μ-(carbonothioyl)]dicarbonylbis(η ⁵ -2,4-cyclopentadien-1-yl)di-(Fe-Fe)-)	67225-86-9		14.74±0.09	EI	5423

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_6H_3SFe_2^+$	$(C_5H_5)_2(CS)(CO)_3Fe_2$ (Iron, μ -carbonothioyl- μ -carbonyldicarbonylbis(η^5 -2,4-cyclopentadien-1-yl)di-(Fe-Fe)-)	67113-80-8	$C_5H_5 + 3CO$	16.79 ± 0.02	EI	5423
	$(C_5H_5)_2(CS)_2(CO)_2Fe_2$ (Iron,bis[μ -(carbonothioyl)]dicarbonylbis(η^5 -2,4-cyclopentadien-1-yl)di-(Fe-Fe)-)	67225-86-9		17.19 ± 0.02	EI	5423
$C_{11}H_{10}SFe_2^+$	$(C_5H_5)_2(CS)(CO)_3Fe_2$ (Iron, μ -carbonothioyl- μ -carbonyldicarbonylbis(η^5 -2,4-cyclopentadien-1-yl)di-(Fe-Fe)-)	67113-80-8	3CO	10.44 ± 0.04	EI	5423
	$(C_5H_5)_2(CS)_2(CO)_2Fe_2$ (Iron,bis[μ -(carbonothioyl)]dicarbonylbis(η^5 -2,4-cyclopentadien-1-yl)di-(Fe-Fe)-)	67225-86-9	2CO + CS	12.61 ± 0.04	EI	5423
$C_7H_5S_2Fe_2^+$	$(C_5H_5)_2(CS)_2(CO)_2Fe_2$ (Iron,bis[μ -(carbonothioyl)]dicarbonylbis(η^5 -2,4-cyclopentadien-1-yl)di-(Fe-Fe)-)	67225-86-9		13.23 ± 0.02	EI	5423
$C_{12}H_{10}S_2Fe_2^+$	$(C_5H_5)_2(CS)_2(CO)_2Fe_2$ (Iron,bis[μ -(carbonothioyl)]dicarbonylbis(η^5 -2,4-cyclopentadien-1-yl)di-(Fe-Fe)-)	67225-86-9	2CO	8.89 ± 0.03	EI	5423
$C_9H_{18}N_3S_6Fe^+$	$[S_2CN(CH_3)_2]_3Fe$	14484-64-1	**	7.72 (V)	PE	4710
$C_6O_6S_2Fe_2^+$	$(CO)_6Fe_2S_2$	14243-23-3	**	7.9 (V)	PE	5536
$C_7H_5OSFe^+$	$(C_5H_5)_2(CS)(CO)_3Fe_2$ (Iron, μ -carbonothioyl- μ -carbonyldicarbonylbis(η^5 -2,4-cyclopentadien-1-yl)di-(Fe-Fe)-)	67113-80-8		13.13 ± 0.03	EI	5423
	$(C_5H_5)_2(CS)_2(CO)_2Fe_2$ (Iron,bis[μ -(carbonothioyl)]dicarbonylbis(η^5 -2,4-cyclopentadien-1-yl)di-(Fe-Fe)-)	67225-86-9		13.83 ± 0.11	EI	5423
$C_{12}H_{10}OSFe_2^+$	$(C_5H_5)_2(CS)(CO)_3Fe_2$ (Iron, μ -carbonothioyl- μ -carbonyldicarbonylbis(η^5 -2,4-cyclopentadien-1-yl)di-(Fe-Fe)-)	67113-80-8	2CO	8.58 ± 0.02	EI	5423
$C_{13}H_{10}O_2SFe_2^+$	$(C_5H_5)_2(CS)(CO)_3Fe_2$ (Iron, μ -carbonothioyl- μ -carbonyldicarbonylbis(η^5 -2,4-cyclopentadien-1-yl)di-(Fe-Fe)-)	67113-80-8	CO	7.62 ± 0.02	EI	5423
$C_{11}H_{10}O_3SFe_2^+$	$(C_5H_5)_2(CS)(CO)_3Fe_2$ (Iron, μ -carbonothioyl- η -carbonyldicarbonylbis(η^5 -2,4-cyclopentadien-1-yl)di-(Fe-Fe)-)	67113-80-8	**	6.46 ± 0.02	EI	5423
$C_{13}H_{10}OS_2Fe_2^+$	$(C_5H_5)_2(CS)_2(CO)_2Fe_2$ (Iron,bis[μ -(carbonothioyl)]dicarbonylbis(η^5 -2,4-cyclopentadien-1-yl)di-(Fe-Fe)-)	67225-86-9	CO	7.47 ± 0.02	EI	5423
$C_{11}H_{10}O_2S_2Fe_2^+$	$(C_5H_5)_2(CS)_2(CO)_2Fe_2$ (Iron,bis[μ -(carbonothioyl)]dicarbonylbis(η^5 -2,4-cyclopentadien-1-yl)di-(Fe-Fe)-)	67225-86-9	**	6.76 ± 0.04	EI	5423

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{12}H_{11}O_6S_2Fe^+$ (<i>iso</i> -C ₄ H ₇ S) ₂ (CO) ₆ Fe ₂		26411-94-9	**	7.5 (V)	PE	5536
$C_8H_{12}N_2O_2S_4Fe^+$ [S ₂ CN(CH ₃) ₂] ₂ (CO) ₂ Fe		36309-89-4	**	8.51 (V)	PE	4710
$C_{11}H_{20}N_2O_2S_4Fe^+$ [C ₅ H ₁₀ N(CS ₂)] ₂ (CO) ₂ Fe (Iron, dicarbonylbis(1-piperidinecarbodithioato-S,S')-(OC-6-21)-)		35816-66-1	**	8.57 (V)	PE	4710
$C_{18}H_{16}N_2O_2S_4Fe^+$ C ₁₈ H ₁₆ N ₂ O ₂ S ₄ Fe (Iron, dicarbonylbis(methylphenylcarbomodithioato-S,S')-(OC-6-21)-)		63796-70-3	**	7.77 (V)	PE	4710
$C_{18}H_{28}N_2O_2S_4Fe^+$ C ₁₈ H ₂₈ N ₂ O ₂ S ₄ Fe (Iron, dicarbonylbis(2,6-dimethyl-1-piperidinecarbodithioato-S,S')-(OC-6-21)-)		63796-67-8	**	8.26 (V)	PE	4710
$C_{20}H_{20}N_2O_2S_4Fe^+$ C ₂₀ H ₂₀ N ₂ O ₂ S ₄ Fe (Iron, dicarbonylbis(ethylphenylcarbomodithioato-S,S')-(OC-6-21)-)		63796-69-0	**	7.76 (V)	PE	4710
$C_{22}H_{24}N_2O_2S_4Fe^+$ C ₂₂ H ₂₄ N ₂ O ₂ S ₄ Fe (Iron, dicarbonylbis[ethyl(phenylmethyl)carbomodithioato-S,S']-(OC-6-21)-)		63796-64-5	**	7.90 (V)	PE	4710
$C_{28}H_{20}N_2O_2S_4Fe^+$ C ₂₈ H ₂₀ N ₂ O ₂ S ₄ Fe (Iron, dicarbonylbis(diphenylcarbomodithioato-S,S')-(OC-6-21)-)		63796-68-9	**	7.58 (V)	PE	4710
$C_{12}H_{16}N_2O_4S_4Fe^+$ C ₁₂ H ₁₆ N ₂ O ₄ S ₄ Fe (Iron, dicarbonylbis(4-morpholinecarbodithioato-S,S')-(OC-6-21)-)		63796-66-7	**	8.64 (V)	PE	4710
$C_{10}H_9NO_6SF_2^+$ (<i>tert</i> -C ₄ H ₉ NS)(CO) ₆ Fe ₂		41812-87-7	**	7.8 (V)	PE	5536
Cl_2Fe^+	FeCl ₂	7758-94-3	**	10.34 (V)	PE	5172
$C_{10}H_9ClFe^+$	(C ₅ H ₅)(C ₅ H ₄ Cl)Fe (Ferrocene, chloro-)	1273-74-1	**	6.83±0.05	PI	3729
$C_{10}H_8Cl_2Fe^+$	(C ₅ H ₄ Cl) ₂ Fe (Ferrocene, 1,1'-dichloro-)	1293-67-0	**	7.03 (V)	PE	3688
$C_{41}H_{28}N_4ClFe^+$	C ₂₀ H ₈ N ₄ (C ₆ H ₅) ₄ FeCl (Iron, chloro[5,10,15,20-tetraphenyl-21H,23H-porphinato(2-)-N ²¹ ,N ²² ,N ²³ ,N ²⁴]- (SP-5-12)-)	16456-81-8	**	6.09±0.2	OTH	4962
$C_7H_5O_2ClFe^+$	C ₅ H ₅ (CO) ₂ FeCl (Iron, dicarbonylchloro(η ⁵ -2,4-cyclopentadien-1-yl)-)	12107-04-9	**	8.00 (V)	PE	4565
			**	8.00 (V)	PE	4570
$C_6H_2O_4Cl_2Fe^+$	CCl ₂ CH ₂ (CO) ₄ Fe <i>trans</i> -C ₂ H ₃ Cl ₂ (CO) ₄ Fe	52613-75-9	**	8.82 (V)	PE	4908
		52646-80-7	**	8.72 (V)	PE	4908

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
Co^+	$(\text{C}_5\text{H}_5)_2\text{Co}$ (Cobaltocene)	1277-43-6		14.10 ± 0.15	EI	4072
	$\text{Cl}_3\text{SiCo}(\text{CO})_3\text{PF}_4$	37769-28-1		18.9 ± 0.5	EI	3653
	$\text{Cl}_3\text{SiCo}(\text{CO})_2(\text{PF}_3)_2$	37769-29-2		18.9 ± 0.4	EI	3653
$\text{C}_3\text{H}_3\text{Co}^+$	$(\text{C}_5\text{H}_5)_2\text{Co}$ (Cobaltocene)	1277-43-6		17.50 ± 0.2	EI	4072
$\text{C}_5\text{H}_5\text{Co}^+$	$(\text{C}_5\text{H}_5)_2\text{Co}$ (Cobaltocene)	1277-43-6		13.20 ± 0.2	EI	4072
				14.0 ± 0.3	EI	3793
$\text{C}_{10}\text{H}_{10}\text{Co}^+$	$(\text{C}_5\text{H}_5)_2\text{Co}$ (Cobaltocene)	1277-43-6	**	5.55 (V)	PE	5394
			**	5.56 (V)	PE	5507
			**	5.7 ± 0.2	EI	3793
			**	5.95 ± 0.1	EI	4072
$\text{C}_{12}\text{H}_{11}\text{Co}^+$	$(\text{C}_7\text{H}_7\text{CH}_3)_2\text{Co}$ (Cobaltocenium, 1,1'-dimethyl-)	40759-60-2	**	5.37 (V)	PE	5507
$\text{C}_{20}\text{H}_{30}\text{Co}^+$	$(\text{C}_5(\text{CH}_3)_2)_2\text{Co}$ (Cobaltocene, decamethyl-)	XXXXX-XX-X	**	4.705 (V)	PE	5394
$\text{C}_2\text{H}_2\text{Co}_2^+$	$\text{CH} \equiv \text{CH}(\text{CO})_6\text{Co}_2$ (Cobalt, hexacarbonyl(ethyne)di-)	12553-66-1	6CO	15.58 ± 0.05	EI	4116
	$(\text{CO})_6\text{CH}_3\text{C} \equiv \text{CCH}_3\text{Co}_2$ (Cobalt, (2-butyne)hexacarbonyl di-)	12282-08-5	6CO	15.60 ± 0.05	EI	4116
$\text{BC}_{11}\text{H}_{13}\text{Co}^+$	$(\text{C}_5\text{H}_5)(\text{C}_5\text{H}_4\text{BCH}_3)\text{Co}$ (Cobalt, $(\eta^5-2,4\text{-cyclopentadien-1-yl})[(1,2,3,4,5,6\text{-}\eta)\text{-1-methylboratabenzene}]\text{-}$)	36534-25-5	**	6.56 ± 0.1	EI	3545
$\text{B}_2\text{C}_{12}\text{H}_{16}\text{Co}^+$	$(\text{C}_5\text{H}_5\text{BCH}_3)_2\text{Co}$ (Cobalt, bis[(1,2,3,4,5,6- η)-1-methylboratabenzene]-)	36534-27-7	**	7.15 ± 0.1	EI	3545
$\text{BC}_{16}\text{H}_{15}\text{Co}^+$	$(\text{C}_5\text{H}_5)(\text{C}_5\text{H}_4\text{BC}_6\text{H}_5)\text{Co}$ (Cobalt, $(\eta^5-2,4\text{-cyclopentadien-1-yl})[(1,2,3,4,5,6\text{-}\eta)\text{-1-phenylboratabenzene}]\text{-}$)	36682-12-9	**	6.63 ± 0.1	EI	3545
$\text{B}_2\text{C}_{22}\text{H}_{20}\text{Co}^+$	$(\text{C}_5\text{H}_5\text{BC}_6\text{H}_5)_2\text{Co}$ (Cobalt, bis[(1,2,3,4,5,6- η)-1-phenylboratabenzene]-)	36534-31-3	**	7.25 ± 0.1	EI	3545
$\text{C}_{16}\text{H}_{16}\text{N}_1\text{Co}^+$	$\text{C}_{16}\text{H}_{16}\text{N}_1\text{Co}$ (Cobalt, [N,N'-bis[(2-aminophenyl)methylene]-1,2-ethanediaminato(2-)-N,N',N'',N''']-)	21177-97-9	**	6.98 ± 0.10	EI	4668
$\text{C}_{36}\text{H}_{41}\text{N}_1\text{Co}^+$	$((\text{C}_5\text{H}_5)_2\text{C}_1\text{NCH})_2\text{Co}$ (Cobalt, [2,3,7,8,12,13,17,18-octaethyl-21H,23H-porphinato(2-)-N ²¹ ,N ²² ,N ²³ ,N ²⁴]-[SP-4-1]-)	17632-19-8	**	6.09 ± 0.03 (V)	PE	5476

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₁₁H₂₈N₄Co⁺	C ₂₀ H ₈ N ₄ (C ₆ H ₅) ₄ Co (Cobalt, [5,10,15,20-tetraphenyl-21H,23H-porphinato(2-)-N ²¹ ,N ²² ,N ²³ ,N ²⁴]- (SP-4-1)-)	14172-90-8	**	6.12±0.2	OTH	4962
C₃₂H₁₆N₈Co⁺	C ₃₂ H ₁₆ N ₈ Co (Cobalt, [29H,31H-phthalocyaninato(2-)-N ²⁹ ,N ³⁰ ,N ³¹ ,N ³²]- (SP-4-1)-)	3317-67-7	**	7.46±0.10	EI	3829
CoCo⁺	Cl ₃ SiCo(CO) ₃ PF ₃	37769-28-1		16.7±0.3	EI	3653
	Cl ₃ SiCo(CO) ₃ (PF ₃) ₂	37769-29-2		16.9±0.4	EI	3653
C₂O₂Co⁺	Cl ₃ SiCo(CO) ₃ PF ₃	37769-28-1		15.5±0.4	EI	3653
	Cl ₃ SiCo(CO) ₃ (PF ₃) ₂	37769-29-2		15.5±0.3	EI	3653
C₁HO₁Co⁺	(CO) ₄ CoH	16842-03-8	**	8.90±0.02 (V)	PE	3827
			**	8.90 (V)	PE	4456
C₁₀H₁₁O₄Co⁺	(CH ₃ C(O)=CHCOCH ₃) ₂ Co	14024-48-7	**	8.50 (V)	PE	5100
C₂₂H₁₀O₄Co⁺	(((CH ₃) ₃ CCO) ₂ CH ₂) ₂ Co	XXXXX-XX-X	**	7.92 (V)	PE	5568
C₁₅H₂₁O₆Co⁺	(C ₅ H ₇ O ₂) ₃ Co	21679-46-9	**	7.52 (V)	PE	4965
			**	7.52±0.07 (V)	PE	3682
C₃H₂OC₂⁺	CH≡CH(CO) ₆ Co ₂ (Cobalt, hexacarbonyl(ethyne)di-)	12553-66-1	5CO	14.11±0.05	EI	4116
C₅H₆OC₂⁺	(CO) ₆ CH ₃ C≡CCH ₃ Co ₂ (Cobalt, (2-butyne)hexacarbonyldi-)	12282-08-5	5CO	13.85±0.05	EI	4116
C₁H₂O₂Co₂⁺	CH≡CH(CO) ₆ Co ₂ (Cobalt, hexacarbonyl(ethyne)di-)	12553-66-1	4CO	12.40±0.05	EI	4116
C₆H₆O₂Co₂⁺	(CO) ₆ CH ₃ C≡CCH ₃ Co ₂ (Cobalt, (2-butyne)hexacarbonyldi-)	12282-08-5	4CO	12.36±0.05	EI	4116
C₅H₂O₃Co₂⁺	CH≡CH(CO) ₆ Co ₂ (Cobalt, hexacarbonyl(ethyne)di-)	12553-66-1	3CO	10.96±0.05	EI	4116
C₇H₆O₃Co₂⁺	(CO) ₆ CH ₃ C≡CCH ₃ Co ₂ (Cobalt, (2-butyne)hexacarbonyldi-)	12282-08-5	3CO	10.98±0.05	EI	4116
C₆H₂O₄Co₂⁺	CH≡CH(CO) ₆ Co ₂ (Cobalt, hexacarbonyl(ethyne)di-)	12553-66-1	2CO	9.74±0.05	EI	4116

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_8H_6O_4Co_2^+$	(CO) ₆ CH ₃ C≡CCH ₃ Co ₂ (Cobalt, (2-butynyl)hexacarbonyldi-)	12282-08-5	2CO	9.68±0.05	EI	4116
$C_7H_2O_5Co_2^+$	CH≡CH(CO) ₆ Co ₂ (Cobalt, hexacarbonyl(ethyne)di-)	12553-66-1	CO	8.71±0.05	EI	4116
$C_9H_6O_5Co_2^+$	(CO) ₆ CH ₃ C≡CCH ₃ Co ₂ (Cobalt, (2-butynyl)hexacarbonyldi-)	12282-08-5	CO	8.62±0.05	EI	4116
$C_8H_2O_6Co_2^+$	CH≡CH(CO) ₆ Co ₂ (Cobalt, hexacarbonyl(ethyne)di-)	12553-66-1	**	7.96±0.05	EI	4116
$C_{10}H_6O_6Co_2^+$	(CO) ₆ CH ₃ C≡CCH ₃ Co ₂ (Cobalt, (2-butynyl)hexacarbonyldi-)	12282-08-5	**	7.80±0.05	EI	4116
$C_{15}H_8O_6Co_2^+$	(CO) ₆ CH ₃ C≡CC ₆ H ₅ Co ₂ (Cobalt, hexacarbonyl[μ-(1,2-η:1,2-η)-1-propynylbenzene]]di-, (Co-Co))	53556-74-4	**	7.85±0.05	EI	4116
$B_2C_{12}H_{16}O_2Co^+$	(C ₆ H ₅ BOCH ₃) ₂ Co (Cobalt, bis[(1,2,3,4,5,6-η)-1-methoxyboratabenzene]-)	36534-20-0	**	7.02±0.1	EI	3545
$N_3O_9Co^+$	(NO ₃) ₃ Co	55866-74-5	**	10.79±0.03 (V)	PE	4999
$C_3NO_4Co^+$	(CO) ₃ NOCO	14096-82-3	**	8.26±0.03	PE	5225
$C_{16}H_{14}N_2O_2Co^+$	C ₁₆ H ₁₄ N ₂ O ₂ Co (Cobalt, [[2,2'-(1,2-ethanediy]bis(nitrilomethylidyne)] bis[phenolato]](2-)-N,N',O,O']-)	14167-18-1	**	7.52±0.06	EI	4668
$C_{21}H_{24}N_2O_2Co^+$	C ₂₁ H ₂₄ N ₂ O ₂ Co (Cobalt, [[2,2'-(1,7-heptanediy]bis(nitrilomethylidyne)]bis[phenolato]](2-)-N,N',O,O']-, (T-4)-)	17084-78-5	**	7.78±0.08	EI	4213
$C_{20}H_{23}N_3O_2Co^+$	C ₂₀ H ₂₃ N ₃ O ₂ Co (Cobalt, [[2,2'-(iminobis(3,1-propanediy]nitrilomethylidyne)]bis[phenolato]](2-)-N,N',N'', O,O']-)	15306-22-6	**	7.31±0.07	EI	4213
$C_{20}H_{22}N_2O_3Co^+$	C ₂₀ H ₂₂ N ₂ O ₃ Co (Cobalt, [[2,2'-(oxybis(3,1-propanediy]nitrilomethylidyne)]bis[phenolato]](2-)-N,N',N'', O,O']-(T-4)-)	52279-51-3	**	7.53±0.10	EI	4213
$C_{15}H_{18}N_3O_{12}Co^+$	(C ₅ H ₆ O ₂ NO ₂) ₃ Co (Cobalt, tris(3-nitro-2,4-pentanedionato-O ²⁻ ,O ⁴⁻)-(OC-6-11)-)	15169-25-2	**	8.51 (V)	PE	4965
$C_1F_6Co_2^+$	CF ₃ C≡CCF ₃ (CO) ₆ Co ₂ (Cobalt, hexacarbonyl(1,1,1,4,4,4-hexafluoro-2-butynyl)di-)	12557-89-0	6CO	15.72±0.05	EI	4116

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_7OF_6Co^+$	$CF_3C\equiv CCF_3(CO)_6Co_2$ (Cobalt, hexacarbonyl(1,1,1,4,4,4-hexafluoro-2-butyne)di-)	12557-89-0	5CO	14.23 ± 0.05	EI	4116
$C_6O_2F_6Co^+$	$CF_3C\equiv CCF_3(CO)_6Co_2$ (Cobalt, hexacarbonyl(1,1,1,4,4,4-hexafluoro-2-butyne)di-)	12557-89-0	4CO	12.84 ± 0.05	EI	4116
$C_7O_3F_6Co^+$	$CF_3C\equiv CCF_3(CO)_6Co_2$ (Cobalt, hexacarbonyl(1,1,1,4,4,4-hexafluoro-2-butyne)di-)	12557-89-0	3CO	11.94 ± 0.05	EI	4116
$C_8O_4F_6Co^+$	$CF_3C\equiv CCF_3(CO)_6Co_2$ (Cobalt, hexacarbonyl(1,1,1,4,4,4-hexafluoro-2-butyne)di-)	12557-89-0	2CO	10.48 ± 0.05	EI	4116
$C_9O_5F_6Co^+$	$CF_3C\equiv CCF_3(CO)_6Co_2$ (Cobalt, hexacarbonyl(1,1,1,4,4,4-hexafluoro-2-butyne)di-)	12557-89-0	CO	9.53 ± 0.05	EI	4116
$C_{10}O_6F_6Co^+$	$CF_3C\equiv CCF_3(CO)_6Co_2$ (Cobalt, hexacarbonyl(1,1,1,4,4,4-hexafluoro-2-butyne)di-)	12557-89-0	**	8.88 ± 0.05	EI	4116
$C_{10}H_8O_4F_6Co^+$	$(CF_3C(O)=CHCOCH_3)_2Co$	47115-08-2	**	9.35 (V)	PE	5100
$C_{15}H_3O_6F_{18}Co^+$	$(CF_3COCHCOCF_3)_3Co$ (Cobalt, tris(1,1,1,5,5,5-hexafluoro-2,4-pentanedionato- <i>O,O'</i>)-, (<i>OC</i> -6-11)-)	16702-37-7	**	9.73 ± 0.07 (V)	PE	3682
$C_4H_3O_4SiCo^+$	$(SiH_3)_3(CO)_4Co$	14652-62-1	**	8.85 ± 0.02 (V)	PE	3827
F_3PCo^+	$Cl_3SiCo(CO)_3PF_3$	37769-28-1		16.9 ± 0.4	EI	3653
	$Cl_3SiCo(CO)_2(PF_3)_2$	37769-29-2		16.7 ± 0.3	EI	3653
$HF_{12}P_4Co^+$	$H(PF_3)_4Co$	19454-38-7	**	9.58 (V)	PE	4456
$C_{10}H_{11}S_4Co^+$	$(CH_3C(S)=CHCSCH_3)_2Co$	10170-78-2	**	7.20 (V)	PE	5100
$C_{12}H_{18}N_2S_2Co^+$	$(CH_3C(=S)CH_2C(CH_3)NCH_3)_2Co$	41254-15-3	**	6.50 (V)	PE	5446
$C_{10}H_{14}O_2S_2Co^+$	$(CH_3C(O)=CHCSCH_3)_2Co$	23523-21-9	**	7.50 (V)	PE	5100
$C_{20}H_{22}N_2O_2SCo^+$	$C_{20}H_{22}N_2O_2SCo$ (Cobalt, [[2,2'-(thiobis(3,1-propanediyl)nitrimethylidyne)]bis[phenolato]](2-)- <i>N,N'</i> , <i>O,O'</i> -], (<i>T</i> -4)-)	52279-54-6	**	7.58 ± 0.07	EI	4213
$C_{12}H_{30}O_6P_3S_6Co^+$	$((C_2H_5)_2S_2PO_2)_3Co$	14177-94-7	**	7.95 (V)	PE	5203
$ClCo^+$	$Cl_3SiCo(CO)_3PF_3$	37769-28-1		18.7 ± 0.4	EI	3653
	$Cl_3SiCo(CO)_2(PF_3)_2$	37769-29-2		18.9 ± 0.5	EI	3653

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
Cl_2Co^+	CoCl_2	7646-79-9	**	10.60 (V)	PE	5172
$\text{C}_{15}\text{H}_{18}\text{O}_6\text{Cl}_3\text{Co}^+$	$(\text{C}_5\text{H}_6\text{O}_2\text{Cl})_3\text{Co}$ (Cobalt, tris(3-chloro-2,4-pentanedionato-0,0')-(OC-6-11)-)	14566-97-3	**	7.59 (V)	PE	4965
$\text{C}_{10}\text{H}_4\text{O}_6\text{Cl}_2\text{Co}_2^+$	$(\text{CO})_6\text{CH}_2\text{ClC}\equiv\text{CCH}_2\text{ClCo}_2$ (Cobalt, hexacarbonyl[μ -[(2,3- η :2,3- η)-1,4-dichloro-2-butyne]]di-, (Co-Co))	37685-62-4	**	8.3 ± 0.1	EI	4116
SiCl_2Co^+	$\text{Cl}_3\text{SiCo}(\text{CO})_4\text{PF}_3$ $\text{Cl}_3\text{SiCo}(\text{CO})_2(\text{PF}_3)_2$	37769-28-1 37769-29-2		18.4 ± 0.6 18.4 ± 0.3	EI EI	3653 3653
SiCl_3Co^+	$\text{Cl}_3\text{SiCo}(\text{CO})_4\text{PF}_3$ $\text{Cl}_3\text{SiCo}(\text{CO})_2(\text{PF}_3)_2$	37769-28-1 37769-29-2		13.5 ± 0.4 13.6 ± 0.2	EI EI	3653 3653
$\text{COSiCl}_3\text{Co}^+$	$\text{Cl}_3\text{SiCo}(\text{CO})_4\text{PF}_3$ $\text{Cl}_3\text{SiCo}(\text{CO})_2(\text{PF}_3)_2$	37769-28-1 37769-29-2		11.9 ± 0.3 11.9 ± 0.3	EI EI	3653 3653
$\text{C}_2\text{O}_2\text{SiCl}_3\text{Co}^+$	$\text{Cl}_3\text{SiCo}(\text{CO})_4\text{PF}_3$ $\text{Cl}_3\text{SiCo}(\text{CO})_2(\text{PF}_3)_2$	37769-28-1 37769-29-2		10.8 ± 0.4 11.0 ± 0.2	EI EI	3653 3653
$\text{C}_3\text{O}_3\text{SiCl}_3\text{Co}^+$	$\text{Cl}_3\text{SiCo}(\text{CO})_4\text{PF}_3$	37769-28-1		9.6 ± 0.3	EI	3653
$\text{F}_3\text{SiPCL}_3\text{Co}^+$	$\text{Cl}_3\text{SiCo}(\text{CO})_4\text{PF}_3$ $\text{Cl}_3\text{SiCo}(\text{CO})_2(\text{PF}_3)_2$	37769-28-1 37769-29-2		10.2 ± 0.5 10.2 ± 0.4	EI EI	3653 3653
$\text{C}_3\text{O}_3\text{F}_3\text{SiPCL}_2\text{Co}^+$	$\text{Cl}_3\text{SiCo}(\text{CO})_4\text{PF}_3$	37769-28-1		9.8 ± 0.2	EI	3653
$\text{COF}_3\text{SiPCL}_3\text{Co}^+$	$\text{Cl}_3\text{SiCo}(\text{CO})_4\text{PF}_3$ $\text{Cl}_3\text{SiCo}(\text{CO})_2(\text{PF}_3)_2$	37769-28-1 37769-29-2		10.7 ± 0.3 10.9 ± 0.2	EI EI	3653 3653
$\text{C}_3\text{O}_3\text{F}_3\text{SiPCL}_3\text{Co}^+$	$\text{Cl}_3\text{SiCo}(\text{CO})_4\text{PF}_3$	37769-28-1	**	9.4 ± 0.2	EI	3653
$\text{COF}_6\text{SiP}_2\text{Cl}_3\text{Co}^+$	$\text{Cl}_3\text{SiCo}(\text{CO})_2(\text{PF}_3)_2$	37769-29-2		9.7 ± 0.2	EI	3653
$\text{C}_2\text{O}_2\text{F}_6\text{SiP}_2\text{Cl}_3\text{Co}^+$	$\text{Cl}_3\text{SiCo}(\text{CO})_2(\text{PF}_3)_2$	37769-29-2	**	9.3 ± 0.2	EI	3653
Ni^+	Ni $(\text{C}_5\text{H}_5)_2\text{Ni}$ (Nickelocene)	7440-02-0 1271-28-9	** $(\text{C}_5\text{H}_5)_2$	7.6 ± 0.2 13.00 ± 0.25	EI EI	4618 3628
	$(\text{CO})_5\text{Ni}$	13463-39-3	4CO	13.9 ± 0.4	EI	3793
	$\text{C}_5\text{H}_5\text{NiNO}$	12071-73-7		15.8 \pm 0.2	EI	4618
	(Nickel, (η^5 -2,4-cyclopentadien-1-yl)nitrosyl-)			14.8	EI	4015
$\text{C}_3\text{H}_3\text{Ni}^+$	$(\text{C}_5\text{H}_5)_2\text{Ni}$ (Nickelocene)	1271-28-9		16.7 ± 0.1	EI	3628

Ion	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_5H_5Ni^+$	$(C_5H_5)_2Ni$ (Nickelocene)	1271-28-9	C_5H_5	12.6 ± 0.2	EI	3793
	C_5H_5NiNO (Nickel, (η^5 -2,4-cyclopentadien-1-yl)nitrosyl-)	12071-73-7		13.00 ± 0.25	EI	3628
				10.5	EI	4015
$C_6H_{10}Ni^+$	$(C_5H_5)_2Ni$	12077-85-9	** ** **	7.76 (V)	PE	5281
				7.33 ± 0.04	PE	3711
				7.76 (V)	PE	4396
$C_8H_8Ni^+$	$(C_5H_5)_2Ni$ (Nickelocene)	1271-28-9	C_2H_2	12.6 ± 0.1	EI	3628
$C_8H_{11}Ni^+$	$(CH_3CH=CHCH_2)_2Ni$ (Nickel, bis((1,2,3- η)-(1-methyl-2-propenyl))-)	12145-63-0	**	7.53 (V)	PE	4396
	$(CH_2=C(CH_3)CH_2)_2Ni$ (Nickel, bis(1,2,3- η)-2-methyl-2-propenyl-))	12261-14-2	**	7.53 (V)	PE	4396
			**	7.53 (V)	PE	5281
$C_{10}H_{10}Ni^+$	$(C_5H_5)_2Ni$ (Nickelocene)	1271-28-9	** ** ** ** **	6.2	PE	3725
				6.50 (V)	PE	5394
				6.51 (V)	PE	5507
				6.50 ± 0.25	EI	3628
				6.8 ± 0.1	EI	3793
$C_{10}H_{18}Ni^+$	$(CH_3CH=CHCHCH_3)_2Ni$ (Nickel, bis((1,2,3- η)-2-pentenyl))-)	43062-19-7	**	7.22 (V)	PE	4396
$C_{12}H_{14}Ni^+$	$(C_5H_4CH_3)_2Ni$ (Nickelocene, 1,1'-dimethyl-)	1293-95-4	**	6.36 (V)	PE	5507
$C_{20}H_{30}Ni^+$	$(C_5(CH_3)_5)_2Ni$ (Nickelocene, decamethyl-)	XXXXX-XX-X	**	5.82 (V)	PE	5394
$C_{16}H_{16}N_4Ni^+$	$C_{16}H_{16}N_4Ni$ (Nickel, [N,N'-bis[(2-aminophenyl)methylene]-1,2-ethanediaminato(2-)-N,N',N'',N''']-)	15738-33-7	**	6.84 ± 0.08	EI	4668
$C_{36}H_{44}N_4Ni^+$	$((C_2H_5)_2C_4NCH)_2Ni$ (Nickel, [2,3,7,8,12,13,17,18-octaethyl-21H,23H-porphinato(2-)-N ²¹ ,N ²² ,N ²³ ,N ²⁴](SP-4-1)-)	24803-99-4	**	6.38 ± 0.03 (V)	PE	5476
$C_{44}H_{28}N_4Ni^+$	$C_{20}H_8N_4(C_6H_5)_4Ni$ (Nickel, [5,10,15,20-tetraphenyl-21H,23H-porphinato(2-)-N ²¹ ,N ²² ,N ²³ ,N ²⁴](SP-4-1)-)	14172-92-0	** **	6.29 ± 0.2	OTH	4962
				6.44 (V)	PE	4557
$C_{32}H_{16}N_8Ni^+$	$C_{12}H_{16}N_8Ni$ (Nickel, [29H,31H-phthalocyaninato(2-)-N ²⁹ ,N ³⁰ ,N ³¹ ,N ³²](SP-4-1)-)	14055-02-8	**	7.45 ± 0.10	EI	3829

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
CONi ⁺	(CO) ₁ Ni	13463-39-3	3CO	12.6±0.2	EI	4618
C ₂ O ₂ Ni ⁺	(CO) ₁ Ni	13463-39-3	2CO	10.6±0.2	EI	4618
C ₃ O ₃ Ni ⁺	(CO) ₁ Ni	13463-39-3	CO	9.5±0.2	EI	4618
C ₄ O ₄ Ni ⁺	(CO) ₁ Ni	13463-39-3	** **	8.21±0.03 8.8±0.2	PE EI	5225 4618
C ₁₀ H ₁₁ O ₄ Ni ⁺	(CH ₃ COCHCOCH ₃) ₂ Ni (Nickel, bis(2,4-pentanedionato-O,O')-(SP-4-1)-)	3264-82-2	** ** **	7.40 (V) 7.41 (V) 7.61 (V)	PE PE PE	5100 4571 4384
C ₁₀ H ₁₆ O ₄ Ni ⁺	((CH ₃ CO) ₂ CH ₂) ₂ Ni	XXXXX-XX-X	**	7.35 (V)	PE	5568
C ₂₂ H ₁₀ O ₄ Ni ⁺	(((CH ₃) ₃ CCO) ₂ CH ₂) ₂ Ni	XXXXX-XX-X	**	7.40 (V)	PE	5568
C ₅ H ₅ NONi ⁺	C ₅ H ₅ NONi (Nickel, (η ³ -2,4-cyclopentadien-1-yl)nitrosyl-)	12071-73-7	** **	8.29 8.5	PE EI	4234 4015
C ₆ H ₇ NONi ⁺	C ₅ H ₇ (CH ₃)NONi (Nickel, [(1,2,3,4,5-η)-1-methyl-2,4-cyclopentadien-1-yl]nitrosyl-)	32714-42-4	**	8.09	PE	4234
C ₁₂ H ₁₈ N ₂ O ₂ Ni ⁺	C ₁₂ H ₁₈ O ₂ N ₂ Ni (Nickel, [[4,4'-(1,2-ethanediyldinitrilo)bis[2-pentanonato]](2 ⁻)-N,N',O,O']-)	13878-48-3	**	6.80 (V)	PE	3822
C ₁₆ H ₁₄ N ₂ O ₂ Ni ⁺	C ₁₆ H ₁₄ N ₂ O ₂ Ni (Nickel, [[2,2'-(1,2-ethanediybis(nitrilomethylidene)]bis[phenolato]](2 ⁻)-N,N',O,O']-)	14167-20-5	**	7.57±0.09	EI	4668
C ₂₁ H ₂₄ N ₂ O ₂ Ni ⁺	C ₂₁ H ₂₄ N ₂ O ₂ Ni (Nickel, [[2,2'-(1,7-heptanediybis(nitrilomethylidene)]bis[phenolato]](2 ⁻)-N,N',O,O']-)	52358-03-9	**	7.69±0.09	EI	4213
C ₂₀ H ₂₃ N ₃ O ₂ Ni ⁺	C ₂₀ H ₂₃ N ₃ O ₂ Ni (Nickel, [[2,2'-(iminobis(3,1-propanediylnitrilomethylidene)]bis[phenolato]](2 ⁻)-N,N',N'',O,O']-)	15391-40-9	**	7.41±0.08	EI	4213
C ₂₀ H ₂₂ N ₂ O ₃ Ni ⁺	C ₂₀ H ₂₂ N ₂ O ₃ Ni (Nickel, [[2,2'-(oxybis(3,1-propanediylnitrilomethylidene)]bis[phenolato]](2 ⁻)-N,N',O,O',O'']-)	52279-52-4	**	7.61±0.06	EI	4213
C ₁₀ H ₈ O ₄ F ₆ Ni ⁺	(CF ₃ COCHCOCH ₃) ₂ Ni (Nickel, bis(1,1,1-trifluoro-2,4-pentanedionato-O,O')-)	14324-83-5	**	8.25 (V)	PE	4571

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{36}H_{11}N_1Cu^+$	((C ₂ H ₅) ₂ C ₄ NCH) ₄ Cu (Copper, [2,3,7,8,12,13,17,18-octaethyl-21H,23H-porphinato(2-)- N ²¹ ,N ²² ,N ²³ ,N ²⁴]- (SP-4-1)-)	14409-63-3	**	6.31 ± 0.03 (V)	PE	5476
$C_{44}H_{28}N_1Cu^+$	C ₂₀ H ₈ N ₄ (C ₆ H ₅) ₃ Cu (Copper, [5,10,15,20-tetraphenyl-21H,23H-porphinato(2-)-N ²¹ ,N ²² ,N ²³ ,N ²⁴]- (SP-4-1)-)	14172-91-9	**	6.24 ± 0.2	OTH	4962
			**	6.49 (V)	PE	4557
$C_{32}H_{16}N_8Cu^+$	C ₁₂ H ₁₆ N ₈ Cu (Copper, [29H,31H-phthalocyaninato(2-)-N ²⁹ ,N ³⁰ ,N ³¹ ,N ³²]- (SP-4-1)-)	147-14-8	**	7.37 ± 0.10	EI	3829
$C_{10}H_{11}O_1Cu^+$	(CH ₃ C(O)=CHCOCH ₃) ₂ Cu	46369-53-3	**	8.35 (V)	PE	5100
	(CH ₃ COCHCOCH ₃) ₂ Cu	13395-16-9	**	8.20 (V)	PE	4384
	(Copper, bis(2,4-pentanedionato-O,O')-(SP-4-1)-)					
$N_2O_6Cu^+$	(NO ₃) ₂ Cu	XXXXX-XX-X	**	10.47 ± 0.04 (V)	PE	4999
$C_{12}H_{18}N_2O_2Cu^+$	C ₁₂ H ₁₈ O ₂ N ₂ Cu (Copper, [[4,4'-(1,2-ethanediyldinitrilo)bis[2-pentanonato]](2-)-N,N',O,O']-)	14263-53-7	**	7.00 (V)	PE	3822
$C_{16}H_{14}N_2O_2Cu^+$	C ₁₆ H ₁₄ N ₂ O ₂ Cu (Copper, [[2,2'-(1,2-ethanediyldis(nitriolomethylidyne)) bis[phenolato]](2-)-N,N',O,O']-)	14167-15-8	**	7.69 ± 0.09	EI	4668
$C_{21}H_{24}N_2O_2Cu^+$	C ₂₁ H ₂₄ N ₂ O ₂ Cu (Copper, [[2,2'-(1,7-heptanediyldis(nitriolomethylidyne))bis[phenolato]](2-)-N,N',O,O']-)	52279-50-2	**	7.81 ± 0.07	EI	4213
$C_{26}H_{23}N_3O_2Cu^+$	C ₂₆ H ₂₃ N ₃ O ₂ Cu (Copper, [[2,2'-(iminobis(3,1-propanediylnitriolomethylidyne))bis[phenolato]](2-)-N,N',N'', O,O']-)	15391-22-7	**	7.54 ± 0.08	EI	4213
$C_{20}H_{22}N_2O_3Cu^+$	C ₂₀ H ₂₂ N ₂ O ₃ Cu (Copper, [[2,2'-(oxybis(3,1-propanediylnitriolomethylidyne)) bis[phenolato]](2-)-N ² ,N ^{2'} ,O ¹ ,O ^{1'}]-, (SP-4-2)-)	52279-53-5	**	7.75 ± 0.05	EI	4213
$C_{10}H_8O_1F_6Cu^+$	(CF ₃ C(O)=CHCOCH ₃) ₂ Cu	14324-82-4	**	8.95 (V)	PE	5100
$C_{10}H_2O_1F_{12}Cu^+$	(CF ₃ C(O)=CHCOCF ₃) ₂ Cu	14781-45-4	**	10.20 (V)	PE	5100
	(Copper, bis(1,1,1,5,5,5-hexafluoro-2,4-pentane- dionato-O,O')-(SP-4-1)-)		**	9.92 (V)	PE	4384
$C_{12}H_{18}N_2S_2Cu^+$	(CH ₃ C(=S)CH ₂ C(CH ₃)NCH) ₂ Cu	41192-46-5	**	6.35 (V)	PE	5446
$C_{10}H_{11}O_2S_2Cu^+$	(CH ₃ C(O)=CHCSCH ₃) ₂ Cu	27821-98-3	**	7.65 (V)	PE	5100

Ion	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{20}H_{22}N_2O_2SCu^+$	$C_{20}H_{22}N_2O_2SCu$ (Copper, [[2,2'-thiobis(3,1-propanediyl)nitridomethylidyne]]bis[phenolato]](2-)- <i>N,N',O,O'</i>]-, (SP-4-2)-)	52358-04-0	**	7.78 ± 0.06	EI	4213
$ClCu^+$	CuCl	7758-89-6	**	10.7 ± 0.3	EI	5634
	Cu_3Cl_3	11093-65-5	2CuCl CuCl + Cu + Cl 2Cu + 2Cl	16.0 ± 0.05 20.0 ± 0.5 23.3 ± 0.5	EI EI EI	4236 4236 4236
$ClCu_2^+$	Cu_3Cl_3	11093-65-5	CuCl ₂	12.0 ± 0.5	EI	3455
$Cl_2Cu_2^+$	Cu_3Cl_3	12258-96-7	**	9.6 ± 0.03	EI	5634
	Cu_3Cl_3	11093-65-5	CuCl	13.5 ± 0.5	EI	4236
	Cu_3Cl_3	11093-65-5	Cu + Cl	16.7 ± 0.5	EI	4236
	Cu_3Cl_3	11093-67-7		14.0 ± 0.5	EI	3455
$Cl_2Cu_3^+$	Cu_3Cl_3	11093-65-5	Cl	12.8 ± 0.3	EI	5330
$Cl_3Cu_3^+$	Cu_3Cl_3	11093-65-5	**	9.52 (V)	PE	5297
			**	9.6 ± 0.5	EI	4236
			**	9.9 ± 0.5	EI	3455
			**	10.0 ± 0.3	EI	5330
	Cu_3Cl_3	11093-67-7	CuCl	10.4 ± 1.0	EI	4236
$Cl_3Cu_4^+$	Cu_3Cl_3	11093-67-7	Cl	12.2 ± 0.5	EI	4236
				12.4 ± 0.5	EI	3455
$Cl_1Cu_4^+$	Cu_3Cl_3	11093-67-7	**	9.6 ± 0.5	EI	4236
			**	9.9 ± 0.5	EI	3455
$Cl_1Cu_5^+$	Cu_3Cl_3	11093-68-8	Cl	$10.5-1.0$	EI	4236
				10.6 ± 0.5	EI	3455
$Cl_3Cu_5^+$	Cu_3Cl_3	11093-68-8	**	9.2 ± 1.0	EI	4236
			**	9.7 ± 0.5	EI	3455
Zn^+	Zn	7440-66-6	**	9.394	S	5450
			**	9.57 ± 0.07	EI	3745
$C_2H_6Zn^+$	$(CH_3)_2Zn$	544-97-8	**	9.4 (V)	PE	5300
$C_4H_{10}Zn^+$	$(C_2H_5)_2Zn$	557-20-0	**	8.6 (V)	PE	5300
$C_{36}H_{44}N_4Zn^+$	$((C_3H_5)_2C_4NCH)_4Zn$ (Zinc, [2,3,7,8,12,13,17,18-octaethyl-21H,23H-porphinato(2-)- $N^{21},N^{22},N^{23},N^{24}$]-[SP-4-1]-)	17632-18-7	**	6.29 ± 0.03 (V)	PE	5476

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{11}H_{28}N_1Zn^+$	$C_{20}H_{18}N_1(C_6H_5)_1Zn$ (Zinc, [5,10,15,20-tetraphenyl-21H,23H-porphinato(2-)-N ²¹ ,N ²² ,N ²³ ,N ²⁴]- (SP-4-1)-)	14074-80-7	**	6.03±0.2	OTH	4962
				6.42 (V)	PE	4557
$C_{32}H_{16}N_8Zn^+$	$C_{32}H_{16}N_8Zn$ (Zinc, [29H,31H-phthalocyaninato(2-)-N ²⁹ ,N ³⁰ ,N ³¹ ,N ³²]- (SP-4-1)-)	14320-04-8	**	7.37±0.10	EI	3829
$C_{10}H_{11}O_1Zn^+$	$(CH_3COCHCOCH_3)_2Zn$ (Zinc, bis(2,4-pentanedionato-O,O')-(T-4)-)	14024-63-6	**	8.46 (V)	PE	4384
$C_{22}H_{10}O_1Zn^+$	$((CH_3)_3CCO)_2CH_2)_2Zn$	XXXXX-XX-X	**	8.15 (V)	PE	5568
F_2Zn^+	ZnF_2	7783-49-5	**	13.91±0.03	PE	5433
$C_{10}H_2O_1F_{12}Zn^+$	$(CF_3COCHCOCF_3)_2Zn$ (Zinc, bis(1,1,1,5,5,5-hexafluoro-2,4-pentanedionato-O,O')-(T-4)-)	14949-70-3	**	10.25 (V)	PE	4384
$C_{12}H_{36}N_2Si_1Zn^+$	$(N(Si(CH_3)_3)_2)_2Zn$	3999-27-7	**	8.50±0.05 (V)	PE	4725
Cl_2Zn^+	$ZnCl_2$	7646-85-7	**	11.7 (V)	PE	3963
				11.85 (V)	PE	4232
				11.85 (V)	PE	4232
				11.87±0.05 (V)	PE	3833
				12.3 (V)	PE	3963
				12.39±0.05 (V)	PE	3833
				12.41 (V)	PE	4232
				12.41 (V)	PE	4232
				13.0 (V)	PE	3963
				13.07±0.05 (V)	PE	3833
				13.09 (V)	PE	4232
				14.0 (V)	PE	3963
				14.10±0.05 (V)	PE	3833
				14.13 (V)	PE	4232
				19.23 (V)	PE	4232
				19.51 (V)	PE	4232
Ga^+	Ga	7440-55-3	**	6.0±0.3	EI	5067
				6.1±0.4	EI	4111
				6.1	EI	3472
	$(CH_3)_3Ga$	1445-79-0	$C_2H_6 + CH_3$	13.24±0.03	EI	3474
				11.17±0.05	EI	3474
	Ga_2S	12259-25-5	$C_1H_6 + C_2H_3$	9.2±0.3	EI	5229
Ga_2^+	Ga_2S	12259-25-5	S	11.5±0.5	EI	5229
CH_3Ga^+	$(CH_3)_3Ga$	1445-79-0	$2CH_4$	13.65±0.07	EI	3474
$C_2H_3Ga^+$	$(CH_2=CH)_3Ga$	1188-13-2	C_1H_6	10.95±0.05	EI	3474

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_2H_4Ga^+$	$(CH_2=CH)_3Ga$	1188-13-2	$C_2H_3 + C_2H_2$	11.85 ± 0.05	EI	3474
$C_2H_6Ga^+$	$(CH_3)_3Ga$	1445-79-0	CH_3	10.16 ± 0.03	EI	3474
$C_3H_9Ga^+$	$(CH_3)_3Ga$	1445-79-0	** **	9.76 (V) 9.87 ± 0.02	PE EI	4398 3474
$C_4H_6Ga^+$	$(CH_2=CH)_3Ga$	1188-13-2	C_2H_3	11.04 ± 0.08	EI	3474
$C_6H_9Ga^+$	$(CH_2=CH)_3Ga$	1188-13-2	**	10.81 ± 0.1	EI	3474
$C_{12}H_{10}Ga^+$	$(C_6H_5)_3Ga$ (Gallium, triphenyl-)	1088-02-4	C_6H_5	8.63	PI	4055
$C_{18}H_{15}Ga^+$	$(C_6H_5)_3Ga$ (Gallium, triphenyl-)	1088-02-4	**	8.46 ± 0.03	PI	4055
$CNGa^+$	$GaCN$	51750-59-5	**	9 ± 1	EI	4205
FGa^+	GaF	13966-78-4	**	10.7 ± 0.6	EI	3613
F_2Ga^+	GaF_3	7783-51-9		15.1 ± 0.5	EI	3613
$F_3Ga_2^+$	Ga_2F_6	38586-87-7		15.6 ± 0.5	EI	3613
$C_{15}H_3O_6F_{18}Ga^+$	$(CF_3COCHCOCF_3)_3Ga$ (Gallium, tris(1,1,1,5,5,5-hexafluoro-2,4-pentanedionato- <i>O,O'</i>)-, (<i>OC</i> -6-11)-)	19648-92-1	**	10.19 ± 0.07 (V)	PE	3682
SGa^+	Ga_2S	12259-25-5	Ga	$12. \pm 0.5$	EI	5229
SGa_2^+	Ga_2S	12259-25-5	**	7.7 ± 0.3	EI	5229
Cl_3Ga^+	$GaCl_3$	13450-90-3	** ** **	11.52 11.96 (V) 11.96 (V)	PE PE PE	4215 4398 4256
$Cl_6Ga_2^+$	$(GaCl_3)_2$	15654-66-7	** **	11.81 (V) 11.81 (V)	PE PE	4559 4256
Ge^+	Ge	7440-56-4	** ** ** **	7.899 8.1186 7.8 ± 0.5 8.0 ± 0.3	S S EI EI	5495 5495 4200 3610
	GeF_4	14929-46-5		29.4 ± 0.2	EI	5154
	GeS	12024-10-1		13.51 ± 0.03	PI	4936

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
Ge_2^+	Ge_2	12596-05-3	**	7.8	EI	3775
H_1Ge^+	GeH_1	7782-65-2	**	11.34 12.0 (V)	PE PE	3716 3508
$\text{C}_2\text{H}_8\text{Ge}^+$	$(\text{CH}_3)_2\text{GeH}_2$	1449-64-5	**	10.74 (V)	PE	5261
	$\text{C}_2\text{H}_7\text{GeH}_1$	1747-99-5	**	10.4 (V)	PE	4985
$\text{C}_3\text{H}_9\text{Ge}^+$	$(\text{CH}_3)_3\text{Ge}$	865-52-1	CH_3 CH_1	10.05 ± 0.14 10.07 ± 0.07	EI EI	3548 4126
	$(\text{CH}_3)_3\text{CGe}(\text{CH}_3)_3$	1184-91-4	$(\text{CH}_3)_3\text{C}$	9.91 ± 0.22	EI	3548
	$((\text{CH}_3)_3\text{Ge})_2$	993-52-2	$(\text{CH}_3)_3\text{Ge}$	9.96 ± 0.16	EI	3548
	$(\text{CH}_3)_3\text{SiGe}(\text{CH}_3)_3$	31608-80-7	$(\text{CH}_3)_3\text{Si}$	9.99 ± 0.14	EI	3548
	$\text{C}_6\text{H}_7\text{SGe}(\text{CH}_3)_3$ (Germane, trimethyl(phenylthio)-)	4848-62-8		9.83 ± 0.1	EI	4198
	$(\text{CH}_3)_3\text{GeCl}$	1529-47-1	Cl	11.75 ± 0.04	EI	3939
	$\text{C}_5\text{H}_7(\text{CO})_3\text{CrGe}(\text{CH}_3)_3$ (Tricarbonyl(η^5 -2,4-cyclopentadien-1-yl)(trimethylgermyl)chromium)	34962-34-0		9.06 ± 0.1	EI	3495
	$\text{C}_5\text{H}_7(\text{CO})_3\text{MoGe}(\text{CH}_3)_3$ (Tricarbonyl(η^5 -2,4-cyclopentadien-1-yl)(trimethylgermyl)molybdenum)	33306-91-1		9.63 ± 0.14	EI	3495
	$((\text{CH}_3)_3\text{Ge})(\text{CH}_3)_3\text{Sn}$	16393-89-8	$(\text{CH}_3)_3\text{Sn}$	10.01 ± 0.18	EI	3548
	$\text{C}_5\text{H}_7(\text{CO})_3\text{WGe}(\text{CH}_3)_3$ (Tricarbonyl(η^5 -2,4-cyclopentadien-1-yl)(trimethylgermyl)tungsten)	33306-93-3		9.84 ± 0.1	EI	3495
$\text{C}_3\text{H}_{16}\text{Ge}^+$	$(\text{C}_2\text{H}_5)_3\text{GeH}$	1188-14-3	**	9.6 (V)	PE	4985
$\text{C}_4\text{H}_7\text{Ge}^+$	$(\text{CH}_3)_3\text{GeC}\equiv\text{CH}$	2290-58-6	CH_1	10.56 ± 0.07	EI	4126
$\text{C}_4\text{H}_{12}\text{Ge}^+$	$(\text{CH}_3)_4\text{Ge}$	865-52-1	** ** ** **	9.33 ± 0.04 9.38 ± 0.1 9.29 ± 0.14 9.56 ± 0.06	PE PE EI EI	3880 3677 3548 4126
	$(\text{C}_2\text{H}_5)_2\text{GeH}_2$	1631-46-5	**	9.8 (V)	PE	4985
$\text{C}_5\text{H}_5\text{Ge}^+$	$(\text{CH}_3)_2\text{Ge}(\text{C}\equiv\text{CH})_2$	28056-58-8	CH_1	10.94 ± 0.04	EI	4126
$\text{C}_5\text{H}_8\text{Ge}^+$	$\text{C}_5\text{H}_7(\text{GeH}_1)$ (Germane, 2,4-cyclopentadien-1-yl-)	35682-28-1	**	8.5 (V)	PE	4373
$\text{C}_5\text{H}_{10}\text{Ge}^+$	$(\text{CH}_3)_3\text{GeC}\equiv\text{CH}$	2290-58-6	**	9.77 ± 0.04	EI	4126
$\text{C}_6\text{H}_3\text{Ge}^+$	$\text{CH}_3\text{Ge}(\text{C}\equiv\text{CH})_3$	28056-56-6	CH_1	10.74 ± 0.05	EI	4126
$\text{C}_6\text{H}_8\text{Ge}^+$	$(\text{CH}_3)_2\text{Ge}(\text{C}\equiv\text{CH})_2$	28056-58-8	**	10.57 ± 0.07	EI	4126
$\text{C}_6\text{H}_{12}\text{Ge}^+$	$\text{C}_1\text{H}_6\text{Ge}(\text{CH}_3)_2$ (Germacyclopent-3-ene, 1,1-dimethyl-)	1731-10-8	**	9.0 (V)	PE	5550

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_6H_{11}Ge^+$	$CH_2=CHCH_2Ge(CH_3)_3$	762-66-3	**	8.85 (V)	PE	4172
$C_7H_{18}Ge^+$	$(CH_3)_3CGe(CH_3)_3$	1184-91-4	**	8.98 ± 0.12	EI	3548
$C_8H_4Ge^+$	$Ge(C \equiv CH)_4$	4531-35-5	**	11.04 ± 0.05	EI	4126
$C_8H_{18}Ge^+$	$CH_2=CHGe(C_2H_5)_3$	6207-41-6	**	9.2 (V)	PE	3850
$C_8H_{20}Ge^+$	$(C_2H_5)_4Ge$	597-63-7	**	9.3 (V)	PE	3850
			**	9.4 (V)	PE	4985
$C_9H_{14}Ge^+$	$C_6H_5(CH_3)_3Ge$ (Germane, trimethylphenyl-)	1626-00-2	**	8.98 ± 0.05	PE	4589
			**	9.00 (V)	PE	4280
			**	~ 8.75	CTS	3922
$C_9H_{20}Ge^+$	$CH_2=CHCH_2Ge(C_2H_5)_3$	1793-90-4	**	8.8 (V)	PE	3850
$C_{10}H_{11}Ge^+$	$C_8H_8Ge(CH_3)_2$ (1H-2-Benzogermole, 2,3-dihydro-2,2-dimethyl-)	27490-21-7	**	8.39	CTS	3546
$C_{10}H_{16}Ge^+$	$C_6H_5CH_2(CH_3)_3Ge$ (Germane, trimethyl(phenylmethyl)-)	2848-62-6	**	8.25 (V)	PE	4172
			**	8.36 ± 0.05	PE	4589
			**	8.40 (V)	PE	4280
			**	8.19	CTS	3922
			**	8.26	CTS	3546
$C_{12}H_{18}Ge^+$	$C_6H_5Ge(CH_3)_3$ (Germane, 1-indanyltrimethyl-)	27490-24-0	**	8.02	CTS	3546
$C_{13}H_{15}Ge^+$	$C_{10}H_7Ge(CH_3)_3$ (Germane, trimethyl-1-naphthalenyl-)	XXXXX-XX-X	**	8.00	CTS	3922
$C_{13}H_{22}Ge^+$	$C_6H_5CH_2Ge(C_2H_5)_3$ (Germane, triethyl(phenylmethyl)-)	2945-41-7	**	8.1 (V)	PE	4172
$C_{14}H_{18}Ge^+$	$C_{10}H_7CH_2Ge(CH_3)_3$ (Germane, trimethyl(1-naphthalenylmethyl)-)	51220-35-0	**	7.78	CTS	3922
$C_{18}H_{16}Ge^+$	$(C_6H_5)_3GeH$ (Germane, triphenyl-)	2816-43-5	**	9.15 ± 0.05 (V)	PE	4620
$C_{20}H_{14}Ge^+$	$((CH_3)_3CCH_2)_4Ge$	50654-36-9	**	9.01 ± 0.1 (V)	PE	4242
$C_6H_{18}Ge_2^+$	$((CH_3)_3Ge)_2$	993-52-2	**	8.18 ± 0.11	EI	3548

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
NGe_2^+	Ge_2N	53262-45-6	**	8.4 ± 0.5	EI	4200
$\text{H}_3\text{N}_3\text{Ge}^+$	GeH_3N_3	21138-22-7	**	10.01 ± 0.02 (V)	PE	3670
H_9NGe_3^+	$(\text{GeH}_3)_3\text{N}$	22856-27-5	**	9.2 ± 0.1 (V)	PE	3661
$\text{C}_9\text{H}_{14}\text{N}_2\text{Ge}^+$	$\text{C}_6\text{H}_5\text{N}=\text{NGe}(\text{CH}_3)_3$ (Diazene, phenyl(trimethylgermyl)-)	34472-62-3	**	7.65 ± 0.2 (V)	PE	4581
$\text{C}_8\text{H}_{21}\text{N}_4\text{Ge}^+$	$(\text{N}(\text{CH}_3)_2)_4\text{Ge}$	7344-40-3	**	8.48 (V)	PE	4588
OGe^+ ($^2\Sigma$) ($^2\Pi$) ($^2\Sigma$)	GeO	20619-16-3	**	11.25 ± 0.01 (V)	PE	4760
			**	11.25 ± 0.01 (V)	PE	4883
			**	11.25 (V)	PE	4967
			**	11.40 ± 0.01 (V)	PE	4760
			**	15.17 ± 0.01	PE	4760
			**	11.0 ± 0.3	EI	3610
O_2Ge_2^+	Ge_2O_2	XXXXX-XX-X	**	10.76 ± 0.02 (V)	PE	4760
H_6OGe_2^+	$(\text{GeH}_3)_2\text{O}$	14939-17-4	**	10.40 (V)	PE	3656
$\text{C}_5\text{H}_{12}\text{OGe}^+$	$(\text{CH}_3)_3(\text{COCH}_3)\text{Ge}$	53520-45-9	**	8.5 (V)	PE	4139
CH_3NOGe^+	GeH_3NCO	6928-42-3	**	10.76 ± 0.02 (V)	PE	3670
$\text{C}_8\text{H}_{13}\text{NOGe}^+$	$\text{C}_5\text{H}_4\text{N}(\text{O})\text{Ge}(\text{CH}_3)_3$ (Pyridine, 4-(trimethylgermyl)-, 1-oxide)	28867-08-5	**	8.12 (V)	PE	4222
FGe^+	GeF_4	14929-46-5		23.4 ± 0.4	EI	5154
F_2Ge^+	GeF_2	13940-63-1	**	12.9 ± 0.3	EI	3570
	GeF_4	14929-46-5		20.7 ± 0.3	EI	5154
F_3Ge^+	GeF_4	14929-46-5	F	15.7 ± 0.2	EI	5154
F_4Ge^+	GeF_4	7783-58-6	**	16.06 ± 0.04 (V)	PE	3880
F_4Ge_2^+	Ge_2F_4	12332-08-0	**	13.1 ± 0.3	EI	3570
H_3FGe^+	GeH_3F	13537-30-9	**	12.3 ± 0.1 (V)	PE	3510
$\text{H}_2\text{F}_2\text{Ge}^+$	GeH_2F_2	14986-65-3	**	13.0 ± 0.1 (V)	PE	3510

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$\text{C}_2\text{H}_6\text{F}_2\text{Ge}^+$	$(\text{CH}_3)_2\text{GeF}_2$	811-70-1	**	10.45 (V)	PE	5261
OF_2Ge^+	GeOF_2	XXXXX-XX-X	**	12.3 ± 0.3	EI	3570
$\text{C}_6\text{H}_{18}\text{SiGe}^+$	$(\text{CH}_3)_3\text{SiGe}(\text{CH}_3)_3$	31608-80-7	**	8.31 ± 0.10	EI	3548
$\text{C}_{11}\text{H}_{38}\text{Si}_1\text{Ge}^+$	$(\text{CH}(\text{Si}(\text{CH}_3)_3)_2)_2\text{Ge}$	60111-69-5	**	7.75 ± 0.05 (V)	PE	4725
NSiGe^+	GeSiN	53262-44-5	**	8.6 ± 0.5	EI	4200
$\text{C}_{11}\text{H}_{36}\text{N}_2\text{Si}_2\text{Ge}^+$	$\text{C}_{11}\text{H}_{36}\text{N}_2\text{Si}_2\text{Ge}$	55147-81-4	**	7.24 ± 0.05 (V)	PE	4725
	$(\text{N}(\text{Si}(\text{CH}_3)_3)(\text{tert}-\text{C}_4\text{H}_9))_2\text{Ge}$	XXXXX-XX-X	**	7.26 (V)	PE	4157
$\text{C}_{12}\text{H}_{36}\text{N}_2\text{Si}_1\text{Ge}^+$	$(\text{N}(\text{Si}(\text{CH}_3)_3)_2)_2\text{Ge}$	55290-25-0	**	7.71 ± 0.05 (V)	PE	4725
			**	7.72 (V)	PE	4157
H_3PGe^+	GeH_3PH_2	13573-06-3	**	9.7 ± 0.1 (V)	PE	3661
H_9PGe_3^+	$(\text{GeH}_3)_3\text{P}$	15587-38-9	**	9.0 ± 0.1 (V)	PE	3661
SGe^+	GeS	12025-32-0	**	9.98 ± 0.02	PI	4936
			**	10.18 ± 0.03 (V)	PI	4936
			**	10.35 ± 0.08 (V)	PI	4936
			**	$10.25-10.28$ (V)	PE	4550
			**	10.36 (V)	PE	4967
			**	10.39 (V)	PE	4550
			**	10.9 ± 0.5 (V)	EI	4550
H_1SGe^+	GeH_3SH	21847-06-3	**	9.69 (V)	PE	3656
H_6SGe_2^+	$(\text{GeH}_3)_2\text{S}$	18852-54-5	**	9.25 (V)	PE	3656
$\text{C}_4\text{H}_{12}\text{SGe}^+$	$(\text{CH}_3)_3\text{SCH}_3\text{Ge}$	3860-84-2	**	8.50 ± 0.05 (V)	PE	4153
$\text{C}_8\text{H}_{11}\text{SGe}^+$	$\text{C}_6\text{H}_5\text{S}(\text{CH}_3)_3\text{Ge}$ (Germane, trimethyl(phenylthio)-)	4848-62-8	CH_3	9.95 ± 0.1	EI	4198
$\text{C}_9\text{H}_{11}\text{SGe}^+$	$\text{C}_6\text{H}_5\text{S}(\text{CH}_3)_3\text{Ge}$ (Germane, trimethyl(phenylthio)-)	4848-62-8	**	8.52 ± 0.05	PE	4589
			**	8.08 ± 0.1	EI	4198
$\text{C}_{10}\text{H}_{16}\text{SGe}^+$	$\text{C}_6\text{H}_5(\text{SCH}_3)(\text{CH}_3)_3\text{Ge}$ (Germane, trimethyl[4-(methylthio)phenyl]-)	59163-56-3	**	7.90 ± 0.05 (V)	PE	4627
$\text{C}_{13}\text{H}_{11}\text{SGe}^+$	$\text{C}_{12}\text{H}_9\text{SGe}(\text{CH}_3)_2$ (10H-Phenothiagermanin, 10,10-dimethyl-)	63447-23-4	CH_3	8.7 ± 0.1	EI	4664

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{11}H_{11}SGe^+$	$C_{12}H_9SGe(CH_3)_2$ (10H-Phenothiagermanin, 10,10-dimethyl-)	63447-23-4	**	8.0 ± 0.1	EI	4664
$C_6H_{18}SGe_2^+$	$((CH_3)_3Ge)_2S$	6199-00-4	** **	8.40 ± 0.05 (V) 8.60 ± 0.1	PE EI	4153 4198
CH_3NSGe^+	GeH_3NCS	16475-45-9	**	9.14 ± 0.02 (V)	PE	3670
Cl_3Ge^+	$GeCl_4$ CH_3GeCl_3	10038-98-9 993-10-2	Cl CH_3	12.12 ± 0.04 12.22 ± 0.05	EI EI	3939 3939
Cl_4Ge^+	$GeCl_4$	10038-98-9	**	11.68 ± 0.05	EI	3939
H_3ClGe^+	GeH_3Cl	13637-65-5	** **	11.30 ± 0.02 (V) 11.34 ± 0.05 (V)	PE PE	3510 3502
$H_2Cl_2Ge^+$	GeH_2Cl_2	15230-48-5	**	11.42 ± 0.02 (V)	PE	3510
$C_2H_6ClGe^+$	$(CH_3)_3GeCl$ $(CH_3)_2GeCl_2$	1529-47-1 1529-48-2	CH_3 Cl	10.44 ± 0.04 11.56 ± 0.04	EI EI	3939 3939
$C_3H_9ClGe^+$	$(CH_3)_3GeCl$	1529-47-1	** **	10.35 (V) 9.62 ± 0.04	PE EI	4566 3939
$C_9H_{13}ClGe^+$	$C_6H_5(CH_3)_3GeCl$ (Germane, (4-chlorophenyl)trimethyl-)	56866-67-2	**	8.84 (V)	PE	4438
$CH_3Cl_2Ge^+$	$(CH_3)_2GeCl_2$ CH_3GeCl_3	1529-48-2 993-10-2	CH_3 Cl	11.08 ± 0.05 11.78 ± 0.05	EI EI	3939 3939
$C_2H_6Cl_2Ge^+$	$(CH_3)_2GeCl_2$	1529-48-2	** **	10.65 (V) 10.18 ± 0.05	PE EI	5261 3939
$CH_3Cl_3Ge^+$	CH_3GeCl_3	993-10-2	**	11.11 ± 0.04	EI	3939
$C_8H_{11}CrGe^+$	$C_5H_5(CO)_3CrGe(CH_3)_3$ (Tricarbonyl(η^5 -2,4-cyclopentadien-1-yl)(trimethylgermyl)chromium)	34962-34-0	3CO	10.57 ± 0.24	EI	3495
$C_9H_{11}OCrGe^+$	$C_5H_5(CO)_3CrGe(CH_3)_3$ (Tricarbonyl(η^5 -2,4-cyclopentadien-1-yl)(trimethylgermyl)chromium)	34962-34-0	2CO	9.53 ± 0.15	EI	3495
$C_{10}H_{11}O_2CrGe^+$	$C_5H_5(CO)_3CrGe(CH_3)_3$ (Tricarbonyl(η^5 -2,4-cyclopentadien-1-yl)(trimethylgermyl)chromium)	34962-34-0	CO	9.13 ± 0.1	EI	3495
$C_{11}H_{11}O_3CrGe^+$	$C_5H_5(CO)_3CrGe(CH_3)_3$ (Tricarbonyl(η^5 -2,4-cyclopentadien-1-yl)(trimethylgermyl)chromium)	34962-34-0	**	7.79 ± 0.1	EI	3495

Ion	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_3H_3O_5MnGe^+$	(GeH ₃)(CO) ₅ Mn	25069-08-3	**	8.90±0.02 (V)	PE	3827
$C_1H_3O_1CoGe^+$	(GeH ₃)(CO) ₁ Co	28360-37-4	**	8.80±0.02 (V)	PE	3827
$CuGe^+$	GeCu	12394-89-7	**	7.5	EI	3775
As^+	As	7440-38-2	**	> 10.0	EI	3475
	AsF ₃	7784-35-2	3F	27.0±0.4	EI	5016
	AsCl ₃	7784-34-1	3Cl	20.4±0.4	EI	5016
As_2^+	As ₂	23878-46-8	**	10.1±0.2	S	3567
			**	11.0±0.5	EI	3555
As_i^+	As _i	12187-08-5	**	9.9±0.2	EI	3555
H_3As^+	AsH ₃	7784-42-1	**	9.89	PE	3719
			**	10.58±0.05 (V)	PE	5419
$C_2H_7As^+$	(CH ₃) ₂ AsH	593-57-7	**	8.58	PE	3589
			**	9.14 (V)	PE	4185
$C_3H_9As^+$	(CH ₃) ₃ As	593-88-4	**	8.65 (V)	PE	4226
			**	8.65 (V)	PE	5368
$C_4H_9As^+$	(CH ₂ =CH)(CH ₃) ₂ As	13652-14-7	**	8.68 (V)	PE	5122
$C_4H_{11}As^+$	(CH ₃) ₄ As=CH ₂	19415-86-2	**	6.72 (V)	PE	5368
$C_5H_5As^+$	C_5H_5As (Arsenin)	289-31-6	**	8.8 (V)	PE	3832
$C_5H_{11}As^+$	(CH ₂ =CHCH ₂)(CH ₃) ₂ As	691-35-0	**	8.57 (V)	PE	5122
$C_6H_5As^+$	$(C_6H_5)_3As$ (Arsine, triphenyl-)	603-32-7		8.2±0.1	PI	4325
$C_8H_{11}As^+$	$(C_6H_5)(CH_3)_2As$ (Arsine, dimethylphenyl-)	696-26-4	**	8.67 (V)	PE	5122
$C_9H_{13}As^+$	$(C_6H_5CH_2)(CH_3)_2As$ (Arsine, dimethyl(phenylmethyl))	36678-76-9	**	8.45 (V)	PE	5122
$C_{12}H_{10}As^+$	$(C_6H_5)_3As$ (Arsine, triphenyl-)	603-32-7		9.35±0.1	PI	4325

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{12}H_{11}As^+$	$(C_6H_5)_2AsH$ (Arsine, diphenyl-)	829-83-4	**	7.87 ± 0.01	PE	4154
$C_{12}H_{13}As^+$	$C_6H_5C_6H_4As(CH_3)_2$ (1 <i>H</i> -Arsole, 2,5-dimethyl-1-phenyl-)	20527-10-0	**	8.0 (V)	PE	4090
$C_{18}H_{13}As^+$	$(C_6H_5)_3As$ (Arsine, triphenyl-)	603-32-7	**	7.32 ± 0.05	PI	4325
			**	7.60 ± 0.01	PE	4154
			**	8.03 ± 0.05 (V)	PE	4368
			**	8.11 (V)	PE	5139
$C_{19}H_{13}As^+$	$C_{11}H_8AsC_6H_5$ (Acridarsine, 10-phenyl-)	28660-45-9	**	7.05 (V)	PE	5630
$C_4H_{12}As_2^+$	$((CH_3)_2As)_2$ -trans $((CH_3)_2As)_2$ -gauche	471-35-2	**	7.91 (V)	PE	4185
			**	8.85 (V)	PE	4185
			**	8.85 (V)	PE	4185
$B_2C_6H_{18}N_3As^+$	$N_3B_2(CH_3)_4As(CH_3)_2$ (1,2,4,3,5-Triazadiborolidine, 4-(dimethylarsino)-1,2,3,5-tetramethyl-)	57877-84-6	**	7.5 (V)	PE	4526
$O_6As_4^+$	As_4O_6	12505-67-8	**	10.01 ± 0.05 (V)	PE	4639
			**	10.05 (V)	PE	4704
			**	10.05 (V)	PE	5343
CH_2OAs^+	$As(OCH_3)_3$	6596-95-8		13.88	EI	4339
CH_3OAs^+	$As(OCH_3)_3$	6596-95-8		10.63	EI	4339
CH_4OAs^+	$As(OCH_3)_3$	6596-95-8		13.48	EI	4339
$C_2H_4OAs^+$	$As(OC_2H_5)_3$	3141-12-6		12.30	EI	4339
$C_2H_5OAs^+$	$As(OC_2H_5)_3$	3141-12-6		10.80	EI	4339
$C_2H_6OAs^+$	$As(OC_2H_5)_3$	3141-12-6		12.30	EI	4339
$C_3H_9OAs^+$	$(CH_3)_3As=O$	4964-14-1	**	9.08 (V)	PE	5368
$C_2H_5O_2As^+$	$As(OCH_3)_3$	6596-95-8	CH_3OH	8.98	EI	4339
$C_2H_6O_2As^+$	$As(OCH_3)_3$	6596-95-8	CH_3O	10.03	EI	4339
$C_2H_7O_2As^+$	$As(OCH_3)_3$	6596-95-8	CH_2O	8.80	EI	4339

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$\text{C}_7\text{H}_9\text{O}_2\text{As}^+$	$\text{As}(\text{OC}_2\text{H}_5)_3$	3141-12-6	$\text{C}_2\text{H}_5\text{OH}$	8.60	EI	4339
$\text{C}_7\text{H}_{10}\text{O}_2\text{As}^+$	$\text{As}(\text{OC}_2\text{H}_5)_3$	3141-12-6	$\text{C}_2\text{H}_5\text{O}$	10.03	EI	4339
$\text{C}_7\text{H}_{11}\text{O}_2\text{As}^+$	$\text{As}(\text{OC}_2\text{H}_5)_3$	3141-12-6	$\text{C}_2\text{H}_5\text{O}$	8.52	EI	4339
$\text{C}_3\text{H}_9\text{O}_3\text{As}^+$	$\text{As}(\text{OCH}_3)_3$	6596-95-8	** **	9.73 (V) 7.93	PE EI	4705 4339
FAs^+	AsF_3	7784-35-2		19.6 ± 0.1	EI	5016
	AsF_5	7784-36-3		23.8 ± 0.2	EI	5016
F_2As^+	AsF_3	7784-35-2	F^-	12.80 ± 0.1	EI	5016
	AsF_5	7784-36-3		15.8 ± 0.2	EI	5016
F_3As^+	AsF_3	7784-35-2	** **	12.3 ± 0.05 12.84 ± 0.05	EI EI	5016 3578
	AsF_5	7784-36-3	F_2^-	14.0 ± 0.1	EI	5016
F_4As^+	AsF_5	7784-36-3	F^-	13.8 ± 0.2	EI	5016
$\text{C}_4\text{F}_{12}\text{As}_2^+$	$((\text{CF}_3)_2\text{As})_2$ (<i>Trans</i> conformer)	360-56-5	**	10.39 (V)	PE	4185
$\text{CH}_2\text{F}_3\text{As}^+$	H_2AsCF_3	XXXXX-XX-X	**	14.0 ± 0.05 (V)	PE	5419
$\text{C}_6\text{H}_7\text{F}_6\text{As}^+$	<i>cis</i> -(CH_3) ₂ AsC(CF ₃)=C(CF ₃)H <i>trans</i> -(CH_3) ₂ AsC(CF ₃)=C(CF ₃)H	4648-64-0 4648-63-9	** **	8.61 8.71	PE PE	3589 3589
$\text{C}_8\text{H}_{11}\text{F}_6\text{As}^+$	$(\text{C}_2\text{H}_5)_2\text{AsC}(\text{CF}_3)=\text{C}(\text{CF}_3)\text{H}$	XXXXX-XX-X	**	8.44	PE	3589
$\text{H}_9\text{Si}_3\text{As}^+$	$(\text{SiH}_3)_3\text{As}$	15110-34-6	**	9.3 ± 0.1 (V)	PE	3661
$\text{C}_7\text{H}_{19}\text{SiAs}^+$	$(\text{CH}_3)_3\text{As}=\text{CHSi}(\text{CH}_3)_3$	3607-04-3	**	6.56 (V)	PE	5368
$\text{C}_{10}\text{H}_{27}\text{Si}_2\text{As}^+$	$(\text{CH}_3)_3\text{As}=\text{C}(\text{Si}(\text{CH}_3)_3)_2$	58972-45-5	**	6.66 (V)	PE	5368
$\text{H}_2\text{F}_3\text{SiAs}^+$	F_3SiAsH_2	53098-12-7	**	10.90 ± 0.05 (V)	PE	5419
$\text{C}_2\text{H}_6\text{F}_3\text{SiAs}^+$	$\text{F}_3\text{SiAs}(\text{CH}_3)_2$	60387-29-3	**	9.4 ± 0.05 (V)	PE	5419
PAs^+	AsP	12255-33-3	** **	10.5 ± 0.6 11.2 ± 0.5	EI EI	4120 3555

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
P_3As^+	AsP_3	12511-95-4	**	10.3 ± 0.3	EI	3555
$P_2As_2^+$	As_2P_2	12512-03-7	**	10.3 ± 0.3	EI	3555
PA_3^+	As_3P	12512-11-7	**	10.0 ± 0.3	EI	3555
$S_3As_3^+$	As_3S_3	12279-90-2		9.0 ± 0.7	EI	3475
$S_3As_4^+$	As_4S_3	12512-13-9	**	9.01 (V)	PE	4704
$S_4As_4^+$	As_4S_4	12279-90-2	**	9.0 ± 0.7	EI	3475
$ClAs^+$	$AsCl_4$	7784-34-1		17.7 ± 0.2	EI	5016
Cl_2As^+	$AsCl_3$	7784-34-1	Cl^-	12.4 ± 0.2	EI	5016
Cl_3As^+	$AsCl_3$	7784-34-1	**	10.55 ± 0.025	PE	3626
			**	10.90 (V)	PE	5473
			**	10.57 ± 0.03	EI	3626
			**	11.6 ± 0.05	EI	5016
$C_2H_6SiCl_3As^+$	$Cl_3SiAs(CH_3)_2$	XXXXX-XX-X	**	9.20 ± 0.05 (V)	PE	5419
$C_{24}H_{22}MnAs^+$	(CH ₃ C ₅ H ₄)(CO) ₂ ((C ₆ H ₅) ₃ As)Mn (Manganese,dicarbonyl[(1,2,3,4,5-η)-1-methyl-2,4-cyclopentadien-1-yl](triphenylarsine)-)	XXXXX-XX-X	2CO	8.44 ± 0.03	EI	5576
	$C_{26}H_{22}OSMnAs^+$ (Manganese,(carbonothioyl)carbonyl[(1,2,3,4,5-η)-1-methyl-2,4-cyclopentadien-1-yl](triphenylarsine)-)	XXXXX-XX-X	CO + CS	9.01 ± 0.02	EI	5576
$C_{25}H_{22}OMnAs^+$	(CH ₃ C ₅ H ₄)(CO) ₂ ((C ₆ H ₅) ₃ As)Mn (Manganese,dicarbonyl[(1,2,3,4,5-η)-1-methyl-2,4-cyclopentadien-1-yl](triphenylarsine)-)	XXXXX-XX-X	CO	8.53 ± 0.04	EI	5576
$C_{26}H_{22}O_2MnAs^+$	(CH ₃ C ₅ H ₄)(CO) ₂ ((C ₆ H ₅) ₃ As)Mn (Manganese,dicarbonyl[(1,2,3,4,5-η)-1-methyl-2,4-cyclopentadien-1-yl](triphenylarsine)-)	XXXXX-XX-X	**	6.38 ± 0.03	EI	5576
$C_{25}H_{22}SMnAs^+$	$C_{26}H_{22}OSMnAs$ (Manganese,(carbonothioyl)carbonyl[(1,2,3,4,5-η)-1-methyl-2,4-cyclopentadien-1-yl](triphenylarsine)-)	XXXXX-XX-X	CO	7.57 ± 0.02	EI	5576
$C_{26}H_{22}OSMnAs^+$	$C_{26}H_{22}OSMnAs$ (Manganese,(carbonothioyl)carbonyl[(1,2,3,4,5-η)-1-methyl-2,4-cyclopentadien-1-yl](triphenylarsine)-)	XXXXX-XX-X	**	6.71 ± 0.02	EI	5576

Table of Ion Energetics Measurements—Continued

Ion	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$\text{C}_{22}\text{H}_{15}\text{O}_4\text{FeAs}^+$	$\text{As}(\text{C}_6\text{H}_5)_3(\text{CO})_4\text{Fe}$ (Iron,tetracarbonyl(triphenylarsine)-)	14375-84-9	**	7.50 (V)	PE	5559
Se^+	H_2Se	7783-07-5		12.6 ± 0.1	EI	3633
	CSe_2	506-80-9		13.38 ± 0.02	PI	4936
	$(^1\Sigma_u^+)$		CSe	13.4543	PI	5000
Se_2^+	$(^1\Pi_{g,1/2}) \text{Se}_2$	12185-17-0	**	8.70 ± 0.05	PE	4662
	$(^3\Pi_{g,3/2})$		**	9.13 (V)	PE	4662
	$(^1\Pi_u)$		**	10.68 (V)	PE	4662
			**	11.27 (V)	PE	4662
	$(^1\Sigma_g^-)$		**	12.27 (V)	PE	4662
			**	12.81 (V)	PE	4662
			**	13.31 (V)	PE	4662
	$(^3\Sigma_g^-)$		**	14.00 (V)	PE	4662
	CSe_2	506-80-9		15.21 ± 0.02	PI	4936
Se_5^+	Se_5	12597-28-3	**	7.83 ± 0.02	PE	4662
Se_6^+	Se_6	12597-30-7	**	8.23 ± 0.05	PE	4662
HSe^+	SeH	13940-22-2	**	9.79	S	3742
	H_2Se	7783-07-5	H	13.6 ± 0.2	EI	4610
			H	13.8 ± 0.2	EI	3633
H_2Se^+	$(^2B_1)$	7783-07-5	**	9.88	PE	3719
	$(^2B_1)$		**	9.93	PE	4073
	$(^2A_1)$		**	12.40	PE	3719
	$(^2B_2)$		**	14.11	PE	3719
	$(^2A_1)$		**	21.0 (V)	PE	3719
			**	10.00 ± 0.05	EI	4610
CSe^+	CSe	16674-18-3	**	10.8 ± 0.5	EI	4966
			**	10.943	OTH	5000
	CSe_2	506-80-9		14.37 ± 0.02	PI	4936
			Se	14.586	PI	5000
CSe_2^+	CSe_2	506-80-9	**	9.25	S	5098
	$(^2\Sigma_u^+)$		**	13.6336	S	5000
	$(^3\Sigma_g^+)$		**	15.899	S	5000
	$(^2\Pi_{g,3/2})$		**	9.258 ± 0.0002	PI	5000
	$(\Pi_{3/2})$		**	9.26 ± 0.01	PI	4936
	$(^2\Pi_{1/2})$		**	9.52 ± 0.01	PI	4936
	$(^2\Pi_{g,1/2})$		**	9.524	PI	5000
	$(^2\Sigma_u^+)$		**	13.63 ± 0.02	PI	4936
	$(^2\Sigma_g^+)$		**	15.89 ± 0.02	PI	4936
	$(^2\Pi_{3/2p})$		**	9.26	PE	4309
	$(^2\Pi_{3/2})$		**	9.27 ± 0.01	PE	3965
	$(^2\Pi_{1/2p})$		**	9.52	PE	4309
	$(^2\Pi_{1/2})$		**	9.54 ± 0.01	PE	3965
	$(^2\Pi_u)$		**	11.45	PE	4309
	$(^2\Pi_g)$		**	11.49 ± 0.01	PE	3965
	$(^2\Sigma_u)$		**	13.61	PE	4309

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
CSe₂⁺ (² Σ _u ⁺) (² Σ _g ⁺) (² Σ _g ⁺)	CSe ₂	506-80-9	**	13.63±0.01	PE	3965
			**	15.87	PE	4309
			**	15.90±0.01	PE	3965
			**	9.4±0.5	EI	4966
C₂H₂Se⁺	CH ₂ =C=Se	61134-37-0	**	8.72 (V)	PE	4982
C₂H₃Se⁺	CH ₃ SeCH ₂ CH ₂ CH(NH ₂)COOH	1464-42-2		12.03±0.06	EI	3443
C₂H₆Se⁺	(CH ₃) ₂ Se	593-79-3	**	8.400±0.010	S	3970
			**	8.40 (V)	PE	3656
C₃H₇Se⁺	CH ₃ SeCH ₂ CH ₂ CH(NH ₂)COOH	1464-42-2	C ₂ H ₄ NO ₂	9.34±0.15	EI	3443
C₁H₁Se⁺	C ₁ H ₁ Se (Selenophene)	288-05-1	**	8.776	S	5456
			**	8.80 (V)	PE	3858
			**	8.92 (V)	PE	4626
			**	≤8.92 (V)	PE	3804
			**	9.01±0.05	EI	3482
			**	8.96	CTS	4382
C₁H₈Se⁺	C ₁ H ₈ Se (Selenophene, tetrahydro-)	3465-98-3	**	8.14 (V)	PE	4145
C₅H₆Se⁺	C ₁ H ₃ SeCH ₃ (Selenophene, 2-methyl-)	7559-42-4	**	8.40±0.05 (V)	PE	4626
			**	8.38±0.1	EI	3804
C₆H₁Se⁺	C ₇ H ₁ =C=Se (Methaneselone,2,4-cyclopentadien-1-ylidene-)	72443-10-8	**	8.34 (V)	PE	4982
C₈H₆Se⁺	C ₁₀ H ₆ Se (Benzo[b]selenophene)	272-30-0	**	8.03±0.05	PE	4435
C₈H₁₀Se₂⁺	C ₆ H ₄ (SeCH ₃) ₂ (Benzene,1,4-bis(methylseleno)-)	40400-26-8	**	7.95 (V)	PE	5403
C₆H₁Se₄⁺	(C ₂ H ₂ Se ₂) ₂ (1,3-Diselenole,2-(1,3-diselenol-2-ylidene)-)	54489-01-9	**	7.21	EI	5622
C₁₀H₁₂Se₄⁺	C ₆ Se ₄ (CH ₃) ₄ (1,3-Diselenole, 2-(4,5-dimethyl-1,3-diselenol-2-ylidene)-4,5-dimethyl-)	55259-49-9	**	6.58 (V)	PE	4481
C₃H₆NSe⁺	CH ₃ SeCH ₂ CH ₂ CH(NH ₂)COOH	1464-42-2		10.33±0.07	EI	3443
C₁H₁₀NSe⁺	CH ₃ SeCH ₂ CH ₂ CH(NH ₂)COOH	1464-42-2	CO ₂ H	9.83±0.16	EI	3443

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₇H₉NSe⁺	C ₆ H ₅ (SeCH ₃)NH ₂ (Benzenamine,2-(methylseleno)-)	70086-67-8	**	7.95 (V)	PE	5403
	C ₆ H ₅ (SeCH ₃)NH ₂ (Benzenamine,3-(methylseleno)-)	70086-66-7	**	7.83 (V)	PE	5403
	C ₆ H ₅ (SeCH ₃)NH ₂ (Benzenamine,4-(methylseleno)-)	35065-62-4	**	7.88 (V)	PE	5403
C₂H₂N₂Se⁺	C ₂ H ₂ N ₂ Se (1,2,3-Selenadiazole)	26223-16-5	**	9.69 (V)	PE	4982
C₆H₄N₂Se⁺	C ₆ H ₄ N ₂ Se (1,2,3-Benzoselenadiazole)	123-92-7	**	8.83 (V)	PE	4982
O₂Se⁺ (² A ₁) (² A ₂ + ² B ₂) (² B ₂) (² A ₁ + ² B ₁) (² A ₁)	SeO ₂	7446-08-4	**	11.76 (V)	PE	4817
			**	12.18 (V)	PE	4817
			**	14.56 (V)	PE	4817
			**	14.95 (V)	PE	4817
			**	19.90 (V)	PE	4817
COSe⁺ (² Π _{3/2}) (X ² π _{3/2,1/2}) (² Π _{1/2}) (² Π) (² Σ ⁺)	COSe	1603-84-5	**	10.36±0.01	PE	3965
			**	10.37	PE	4383
			**	10.57±0.01	PE	3965
			**	14.58±0.01	PE	3965
			**	15.75±0.01	PE	3965
C₅H₃OSe⁺	C ₅ H ₃ SeCHO (2-Selenophenecarboxaldehyde)	25109-26-6	**	9.47±0.05	EI	3482
C₅H₆OSe⁺	C ₅ H ₅ Se(=O)(CH ₃) (2(5H)Selenophenone, 5-methyl-)	26562-65-2	**	8.84±0.05	EI	4666
C₆H₆OSe⁺	C ₆ H ₅ SeCOCH ₃ (Ethanone, 1-selenophene-2-yl-)	15429-03-5	**	9.30±0.05	EI	3482
C₆H₈OSe⁺	C ₆ H ₇ Se(=O)(CH ₃) ₂ (3(2H)-Selenophenone, 2,5-dimethyl-)	57556-10-2	**	8.24±0.05	EI	4673
C₇H₁₀OSe⁺	C ₆ H ₅ Se(CH ₃) ₂ OCH ₃ (Selenophene, 3-methoxy-2,5-dimethyl-)	57556-13-5	**	7.69±0.05	EI	4673
	C ₆ H ₅ Se(=O)(CH ₃) ₃ (2(3H)-Selenophenone, 3,3,5-trimethyl-)	57556-20-4	**	7.98±0.05	EI	4666
	C ₆ H ₅ Se(=O)(CH ₃) ₃ (3(2H)-Selenophenone, 2,2,5-trimethyl-)	57556-11-3	**	8.21±0.05	EI	4673
C₈H₁₀OSe⁺	C ₆ H ₄ (SeCH ₃)(OCH ₃) (Benzene,1-methoxy-2-(methylseleno)-)	1657-75-6	**	7.86 (V)	PE	5403
	C ₆ H ₄ (SeCH ₃)(OCH ₃) (Benzene,1-methoxy-3-(methylseleno)-)	2726-42-3	**	7.93 (V)	PE	5403
	C ₆ H ₄ (SeCH ₃)(OCH ₃) (Benzene,1-methoxy-4-(methylseleno)-)	1694-07-1	**	8.05 (V)	PE	5403

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$\text{C}_{12}\text{H}_8\text{OSe}^+$	$\text{C}_{12}\text{H}_8\text{OSe}$ (Phenoxaselenin)	262-22-6	**	7.74 ± 0.05 (V)	PE	4743
$\text{C}_5\text{H}_1\text{O}_2\text{Se}^+$	$\text{C}_5\text{H}_1\text{SeCOOH}$ (2-Selenophenecarboxylic acid)	22968-45-2	**	9.19 ± 0.05 (V)	PE	4626
			**	9.25 ± 0.1	EI	3804
$\text{C}_6\text{H}_6\text{O}_2\text{Se}^+$	$\text{C}_6\text{H}_5\text{SeCOOCH}_3$ (2-Selenophenecarboxylic acid methyl ester)	39697-33-1	**	9.05 ± 0.05 (V)	PE	4626
$\text{C}_4\text{H}_6\text{NOSe}^+$	$\text{CH}_3\text{SeCH}_2\text{CH}_2\text{CH}(\text{NH}_2)\text{COOH}$	1464-42-2	$\text{H}_2\text{O} + \text{CH}_3$	10.00 ± 0.05	EI	3443
$\text{C}_3\text{H}_9\text{NOSe}^+$	$\text{CH}_3\text{SeCH}_2\text{CH}_2\text{CH}(\text{NH}_2)\text{COOH}$	1464-42-2	H_2O	8.73 ± 0.10	EI	3443
$\text{C}_7\text{H}_9\text{NOSe}^+$	$\text{C}_6\text{H}_5\text{SeCON}(\text{CH}_3)_2$ (2-Selenophenecarboxamide, N,N-dimethyl-)	55685-51-3	**	8.85 ± 0.05 (V)	PE	4626
$\text{C}_4\text{H}_3\text{NO}_2\text{Se}^+$	$\text{C}_6\text{H}_3\text{SeNO}_2$ (Selenophene, 2-nitro-)	15429-04-6	**	9.64 ± 0.05 (V)	PE	4626
$\text{C}_4\text{H}_8\text{NO}_2\text{Se}^+$	$\text{CH}_3\text{SeCH}_2\text{CH}_2\text{CH}(\text{NH}_2)\text{COOH}$	1464-42-2	CH_3	9.35 ± 0.10	EI	3443
$\text{C}_5\text{H}_{11}\text{NO}_2\text{Se}^+$	$\text{CH}_3\text{SeCH}_2\text{CH}_2\text{CH}(\text{NH}_2)\text{COOH}$	1464-42-2	**	8.26 ± 0.03	EI	3443
F_2Se^+	SeF_2	14017-34-6	**	10.20 (V)	PE	5074
$\text{C}_6\text{H}_3\text{OF}_3\text{Se}^+$	$\text{C}_6\text{H}_3\text{SeCOCF}_3$ (Ethanone, 2,2,2-trifluoro-1-(selenophene-2-yl)-)	26149-08-6	**	9.64 ± 0.05	EI	3482
$\text{H}_6\text{Si}_2\text{Se}^+$	$(\text{SiH}_3)_2\text{Se}$	14939-45-8	**	9.18 (V)	PE	3656
PSe^+	SeP	12509-41-0	**	8.2	EI	4001
P_1Se_3^+	P_1Se_3	1314-86-9	**	8.71 (V)	PE	4704
$\text{C}_3\text{H}_9\text{O}_3\text{PSe}^+$	$(\text{CH}_3\text{O})_3\text{PSe}$	152-19-2	**	8.67 (V)	PE	4705
SSe^+	SSe	7446-34-6	**	9.2 ± 0.3	EI	4682
CSSe^+ ($^2\Pi_{1/2}$) ($^2\Pi_{3/2,1/2}$) ($X^2\Pi_{1/2}$)	SCSe	5951-19-9	**	9.58 ± 0.01	PE	3965
			**	9.58	PE	4383
			**	9.77 ± 0.01	PE	3965
$\text{C}_4\text{H}_1\text{SSe}^+$	$\text{C}_4\text{H}_1\text{SSe}$ (1,4-Thiaselenin)	290-82-4	**	8.1 ± 0.1 (V)	PE	4841

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_5H_6SSe^+$	$C_4H_5Se(SH)CH_3$ (2-Selenophenethiol, 5-methyl-)	63359-60-4	**	8.17 ± 0.05	EI	4706
$C_6H_8SSe^+$	$C_4H_5Se(CH_3)SCH_3$ (Selenophene, 2-methyl-5-(methylthiol)-)	63359-62-6	**	7.84 ± 0.05	EI	4706
	$C_4HSe(SH)(CH_3)_2$ (3-Selenophenethiol, 2,5-dimethyl-)	63359-61-5	**	7.90 ± 0.05	EI	4706
$C_7H_{10}SSe^+$	$C_4HSe(CH_3)_2SCH_3$ (Selenophene, 2,5-dimethyl-3-(methylthiol)-)	63394-81-0	**	7.73 ± 0.05	EI	4706
$C_8H_{10}SSe^+$	$C_6H_7(SeCH_3)(SCH_3)$ (Benzene, 1-(methylseleno)-4-(methylthio)-)	70086-65-6	**	7.90 (V)	PE	5403
$C_6H_7S_2Se_2^+$	$(C_4H_5S_2Se)_2$ (1,3-Thiaselenole, 2-(1,3-thiaselenol-2-ylidene)-)		**	7.06	CTS	5622
Cl_2Se^+	$SeCl_2$	14457-70-6	** **	9.50 ± 0.2 (V) 9.52 (V)	PE PE	5023 5074
$Cl_2Se_2^+$	Se_2Cl_2	10025-68-0	**	9.81 ± 0.2 (V)	PE	5023
$C_4H_3ClSe^+$	C_4H_3SeCl (Selenophene, 2-chloro-)	1449-67-8	** **	8.83 ± 0.05 (V) 8.72	PE CTS	4626 4382
$C_2H_6PClSe^+$	$(CH_3)_2P(Se)Cl$	XXXXX-XX-X	**	8.64 (V)	PE	5523
$CH_3PCl_2Se^+$	$CH_3P(Se)Cl_2$	2171-82-6	**	9.16 (V)	PE	5523
$C_6O_5SeCr^+$	$(CO)_5(CSe)Cr$	63356-87-6	**	8.03 (V)	PE	5333
$MnSe^+$	$MnSe$	1313-22-0	** **	8.2 ± 0.5 8.2 ± 0.5	EI EI	4901 4966
$GeSe^+$	$SeGe$	12065-10-0	** ** ** ** ** **	9.8 (V) 9.95 (V) 10.20 (V) 13.4 (V) 14.9 (V) 10.2 ± 0.5 (V)	PE PE PE PE PE EI	4967 4550 4550 4550 4550 4550
$H_6Ge_2Se^+$	$(GeH_3)_2Se$	24254-18-0	**	8.84 (V)	PE	3656
Br^+	Br	10097-32-2	** ** **	11.81 11.81 ± 0.02 11.81	S PE PE	5209 5087 5214

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
Br⁺						
^{(1)P₁}	Br	10097-32-2	**	12.20±0.02	PE	5087
^{(3)P₁}			**	12.20	PE	5214
^{(3)P₀}			**	12.28	PE	5214
^{(3)P₀}			**	12.30±0.02	PE	5087
^{(1)D₂}			**	13.28	PE	5214
^{(1)D₂}			**	13.30±0.02	PE	5087
^{(1)S₀}			**	15.26	PE	5214
^{(1)S₀}			**	15.27±0.02	PE	5087
	CH ₃ Br	74-83-9	CH ₃	15.8±0.5	EI	4533
	CH ₂ Br ₂	74-95-3	CH ₂ Br	15.5±0.1	EI	3442
			CH ₂ Br	16.0	EI	3490
	AsBr ₃	7784-33-0	AsBr ₂	15.0±0.2	EI	5016
Br₂⁺						
^{(2)π_{3/2g}}	Br ₂	7726-95-6	**	10.57 (V)	PE	4564
^{(2)π_{1/2g}}			**	10.92 (V)	PE	4564
			**	10.8±0.2	EI	4906
	AsBr ₃	7784-33-0	AsBr	13.4±0.1	EI	5016
HBr⁺						
^{(2)Σ⁺}	HBr	10035-10-6	**	15.2964±0.0025	S	4343
			**	11.66±0.02	PI	5307
^{(2)Π_{3/2}}			**	11.645±0.005	PE	3839
^{(2)Π_{1/2}}			**	11.979±0.005	PE	3839
^{(2)Σ⁺}			**	15.288±0.005	PE	3839
	CH ₃ Br	74-83-9	CH ₂	15.9±0.3	EI	4533
	C ₂ H ₃ Br	593-60-2		18.2±0.1	PI	5079
	(CH ₃) ₂ CBrNO	7119-91-7		11.60	EI	4809
DBr⁺						
^{(2)Π_{3/2}}	DBr	13536-59-9	**	11.673±0.005	PE	3839
^{(2)Π_{1/2}}			**	12.002±0.005	PE	3839
^{(2)Σ⁺}			**	15.284±0.005	PE	3839
H₂Br⁺						
	(HBr) ₂	XXXXX-XX-X Br		11.42±0.03	PI	5307
H₂Br₂⁺						
	(HBr) ₂	XXXXX-XX-X **		10.83±0.05	PI	5307
LiBr⁺						
	LiBr	7550-35-8	**	9.43±0.05 (V)	PE	4950
			**	10.0 (V)	PE	4307
Li₂Br₂⁺						
	(LiBr) ₂	XXXXX-XX-X **		10.05±0.08 (V)	PE	4950
H₈B₅Br⁺						
	B ₅ H ₈ Br (Pentaborane(9), 1-bromo-)	23753-67-5	**	9.71 (V)	PE	4519
	B ₅ H ₈ Br (Pentaborane(9), 2-bromo-)	23753-64-2	**	10.04 (V)	PE	4519
CBr⁺						
	CH ₃ Br	74-83-9	H + H ₂	18.8±0.3	EI	4533
C₁Br₂⁺						
	CBr≡CC≡CBr	36333-41-2	**	9.20±0.02	PE	4162
CBr₃⁺						
	CBr ₃	558-13-4	Br	10.47±0.02	PI	4308

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
CBr₁⁺	CBr ₁	558-13-4	**	10.31±0.02	PI	4308
CHBr⁺	CH ₃ Br	74-83-9	H ₂	16.3±0.5	EI	4533
CH₂Br⁺	CH ₃ Br	74-83-9	H	13.4±0.3	EI	4533
	CH ₂ Br ₂	74-95-3	**	11.35±0.02	PI	4640
CH₃Br⁺	CH ₃ Br	74-83-9	**	10.541	S	5245
			**	10.54±0.01	PI	4640
			**	10.53 (V)	PE	5249
			**	10.5±0.2	EI	4533
C₂HBr⁺	CH≡CBr	593-61-3	**	10.762±0.004	S	3876
C₂H₃Br⁺	C ₂ H ₃ Br	593-60-2	**	9.90±0.01	S	5123
			**	9.80±0.02	PE	3659
			**	9.80	PE	5079
			**	9.83	PE	3863
			**	9.87 (V)	PE	4303
C₂H₁Br⁺	CH ₂ BrCH ₂ Br	106-93-4		10.53	PI	5501
	CH ₃ CHBr ₂	557-91-5		10.48	PI	5501
	CH ₂ BrCH ₂ Cl	107-04-0		10.89	PI	5501
	CH ₃ CHClBr	593-96-4		10.57	PI	5501
C₂H₃Br⁺	C ₂ H ₃ Br	74-96-4	**	10.28 (V)	PE	4076
			**	10.28 (V)	PE	5088
			**	10.29 (V)	PE	5249
C₃H₃Br⁺	CH≡CCH ₂ Br	106-96-7	**	10.43 (V)	PE	4847
			**	10.47 (V)	PE	4684
				10.48	EI	5282
	CH ₃ C≡CBr	2003-82-9	**	9.62±0.02	PE	4765
				9.6	EI	5282
	CH ₂ =C=CHBr	10024-18-7	**	9.46 (V)	PE	4748
C₃H₅Br⁺	CH ₂ =CHCH ₂ Br	106-95-6	**	10.01 (V)	PE	4260
			**	10.06	PE	3863
			**	10.18 (V)	PE	4091
	CH ₂ =CBrCH ₃	557-93-7	**	9.58±0.02 (V)	PE	3659
C₃H₆Br⁺	(CH ₃) ₂ CBrNO	7119-91-7		9.25	EI	4809
C₃H₇Br⁺	<i>n</i> -C ₃ H ₇ Br	106-94-5	**	10.20	PI	5069
			**	10.18	PE	4076
	<i>iso</i> -C ₃ H ₇ Br	75-26-3	**	10.07	PI	5069
			**	10.4±0.1	EI	3735
C₄HBr⁺	CH≡CC≡CBr	6088-90-0	**	9.59±0.02	PE	4162

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₄H₇Br⁺	CH ₂ =CHCH ₂ CH ₂ Br	5162-44-7	**	9.9	EI	5633
C₄H₉Br⁺	<i>n</i> -C ₄ H ₉ Br	109-65-9	**	10.15	PE	4076
	<i>tert</i> -C ₄ H ₉ Br	507-19-7	**	10.05 (V)	PE	4566
C₅H₃Br⁺	CH ₃ C≡CC≡CBr	40201-94-3	**	9.06±0.02	PE	4162
C₅H₉Br⁺	CH ₂ =CH(CH ₂) ₃ Br	1119-51-3	**	9.6	EI	5633
	C ₅ H ₉ Br (Cyclopentane, bromo-)	137-43-9	**	9.94±0.02	PE	4003
C₅H₁₁Br⁺	<i>n</i> -C ₅ H ₁₁ Br	110-53-2	**	10.09	PE	3532
C₆H₁Br⁺	C ₆ H ₄ (Br)COOH (Benzoic acid, 3-bromo-)	585-76-2	CO + OH	14.91±0.2	EI	3973
	C ₆ H ₄ (Br)COOH (Benzoic acid, 4-bromo-)	586-76-5	CO + OH	15.13±0.2	EI	3973
	C ₆ H ₄ BrNO ₂ (Benzene, 1-bromo-3-nitro-)	585-79-5	NO ₂	12.01±0.1	EI	3447
	C ₆ H ₄ BrNO ₂ (Benzene, 1-bromo-4-nitro-)	586-78-7	NO ₂	12.19±0.1	EI	3447
C₆H₅Br⁺	C ₆ H ₅ Br (Benzene, bromo-)	108-86-1	**	8.98	PE	4621
			**	8.99±0.03 (V)	PE	4890
			**	9.00 (V)	PE	3873
			**	9.041 (V)	PE	5257
			**	9.05±0.02	PE	5305
			**	9.05 (V)	PE	5125
			**	9.45	EI	4834
	C ₆ H ₄ BrOCH ₃ (Benzene, 1-bromo-3-methoxy-)	2398-37-0	CH ₂ O	11.59±0.1	EI	3446
	C ₆ H ₄ BrOCH ₃ (Benzene, 1-bromo-4-methoxy-)	104-92-7	CH ₂ O	11.52±0.1	EI	3446
C₆H₁₁Br⁺	C ₆ H ₁₁ Br (Cyclohexane, bromo-)	108-85-0	**	9.85±0.01	PI	4078
			**	9.90±0.02	PE	4003
			**	10.00 (V)	PE	4078
C₆H₇Br⁺	C ₆ H ₅ CH ₂ Br (Benzene, (bromomethyl)-)	100-39-0	**	9.23 (V)	PE	3992
	C ₆ H ₄ BrCH ₃ (Benzene, 1-bromo-2-methyl-)	95-46-5	**	8.58±0.1	EI	3777
	C ₆ H ₄ BrCH ₃ (Benzene, 1-bromo-3-methyl-)	591-17-3	**	8.77	PE	4089
			**	8.60±0.1	EI	3777
	C ₆ H ₄ BrCH ₃ (Benzene, 1-bromo-4-methyl-)	106-38-7	**	8.67	PE	4089
			**	8.70±0.1	EI	3777
C₇H₉Br⁺	C ₇ H ₉ Br (Bicyclo[2.2.1]hept-2-ene, 5-bromo-, <i>endo</i> -)	5810-82-2	**	9.2	EI	5633

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_7H_9Br^+$	C_7H_9Br (Bicyclo[2.2.1]hept-2-ene, 5-bromo-, <i>exo</i> -)	5889-54-3	**	9.2	EI	5633
$C_8H_5Br^+$	$C_8H_5C\equiv CBr$ (Benzene, (bromoethynyl)-)	932-87-6	**	8.65 (V)	PE	4334
	$C_8H_4(Br)C\equiv CH$ (Benzene, 1-bromo-4-ethynyl-)	766-96-1	**	8.62 (V)	PE	4334
$C_{10}H_{15}Br^+$	$C_{10}H_{15}Br$ (Tricyclo[3.3.1.1 ^{3,7}]decane, 1-bromo-)	768-90-1	**	9.2	PE	3907
	$C_{10}H_{15}Br$ (Tricyclo[3.3.1.1 ^{3,7}]decane, 2-bromo-)*	7314-85-4	**	9.30±0.06	PE	3886
			**	9.31±0.05	PE	3886
$C_{12}H_9Br^+$	$C_{12}H_9Br$ (1,1'-Biphenyl, 4-bromo-)	92-66-0	**	8.05±0.02	PE	3702
$C_{11}H_9Br^+$	$C_{11}H_9Br$ (Anthracene, 9-bromo-)	1564-64-3	**	7.48±0.03 (V)	PE	4887
$CHBr_2^+$	$CHBr_3$	75-25-2	**	10.70±0.02	PI	4640
$CH_2Br_2^+$	CH_2Br_2	74-95-3	**	10.52±0.05	PI	4640
$C_2H_2Br_2^+$	CBr_2CH_2	593-92-0	**	9.78±0.01	S	5123
			**	9.78 (V)	PE	4303
	<i>cis</i> -CHBrCHBr	590-11-4	**	9.63±0.01	S	5123
			**	9.32±0.02	PE	3659
			**	9.63 (V)	PE	4303
	<i>trans</i> -CHBr=CHBr	590-12-5	**	9.47±0.01	S	4653
			**	9.55±0.01	S	5123
			**	9.30±0.02	PE	3659
			**	9.55 (V)	PE	4303
			**	9.56 (V)	PE	3648
$C_2H_4Br_2^+$	CH_2BrCH_2Br	106-93-4	**	10.37	PI	5501
			**	10.42	PE	5501
			**	10.57±0.02 (V)	PE	4367
	CH_3CHBr_2	557-91-5	**	10.17	PI	5501
			**	10.17	PE	5501
$C_3H_6Br_2^+$	$Br(CH_2)_3Br$	109-64-8	**	10.26 (V)	PE	4482
$C_4H_8Br_2^+$	$Br(CH_2)_3Br$	110-52-1	**	10.27 (V)	PE	4482
	$CH_3(CHBr)_2CH_3$ (erythro) (Butane, (R',R')-(±)-2,3-dibromo-)	598-71-0	**	10.12 (V)	PE	4482
	$CH_3(CHBr)_2CH_3$ (threo) (Butane, (R',S')-2,3-dibromo-)	5780-13-2	**	10.16 (V)	PE	4482
$C_5H_8Br_2^+$	$C_5H_8Br_2$ (Cyclopentane, 1,2-dibromo-, <i>cis</i> -)	33547-17-0	**	10.02±0.02	PE	4003

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_5H_8Br_2^+$	$C_5H_8Br_2$ (Cyclopentane, 1,2-dibromo-, <i>trans</i> -)	10230-26-9	**	10.08 ± 0.02	PE	4003
			**	10.04 (V)	PE	4482
$C_5H_{10}Br_2^+$	$Br(CH_2)_3Br$	111-24-0	**	10.23 (V)	PE	4482
$C_6H_4Br_2^+$	$C_6H_4Br_2$ (Benzene, 1,2-dibromo-)	583-53-9	**	8.99 ± 0.03 (V)	PE	4890
			**	9.02 (V)	PE	3873
	$C_6H_4Br_2$ (Benzene, 1,3-dibromo-)	108-36-1	**	9.05 ± 0.03 (V)	PE	4890
			**	9.10 (V)	PE	3873
	$C_6H_4Br_2$ (Benzene, 1,4-dibromo-)	106-37-6	**	8.90 ± 0.03 (V)	PE	4890
			**	8.909 (V)	PE	5257
$C_6H_{10}Br_2^+$	$C_6H_{10}Br_2$ (Cyclohexane, 1,2-dibromo- <i>cis</i> -)	19246-38-9	**	9.94 ± 0.02	PE	4003
			**	10.02 \pm 0.02	PE	4003
	$C_6H_{10}Br_2$ (Cyclohexane, 1,2-dibromo-, <i>trans</i> -)	7429-37-0	**	10.06 ± 0.01 (V)	PE	5218
			**			
$C_{10}H_6Br_2^+$	$C_{10}H_6Br_2$ (Azulene, 1,3-dibromo-)	14658-95-8	**	7.40 (V)	PE	5397
$C_{12}H_8Br_2^+$	$(C_6H_4Br)_2$ (1,1'-Biphenyl, 2,2'-dibromo-)	13029-09-9	**	8.40 ± 0.02	PE	3702
$C_{11}H_8Br_2^+$	$C_{11}H_8Br_2$ (Anthracene, 9,10-dibromo-)	523-27-3	**	7.58	PE	4364
$CHBr_3^+$	$CHBr_3$	75-25-2	**	10.48 ± 0.02	PI	4640
			**	10.47 (V)	PE	4146
$C_6H_3Br_3^+$	$C_6H_3Br_3$ (Benzene, 1,3,5-tribromo-)	626-39-1	**	8.91 (V)	PE	3873
			**	9.21 ± 0.02	PE	5305
$Be C_5H_5Br^+$	$(C_5H_5)BeBr$ (Beryllium, bromo(η^5 -2,4-cyclopentadien-1-yl)-)	52140-35-9	**	9.52 (V)	PE	5384
$BC_2H_6Br^+$	$(CH_3)_2BrB$	5158-50-9	**	10.35 (V)	PE	4398
			**	10.25	PE	5485
$B_4C_2H_5Br^+$	$C_2B_4H_5Br$ (1,6-Dicarbaheptaborane(6), 2-bromo-)	XXXXX-XX-X	**	9.43 (V)	PE	5553
$BCH_3Br_2^+$	CH_3Br_2B	17933-16-3	**	10.61 (V)	PE	4398

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
BCH₃Br₂⁺	CH ₃ Br ₂ B	17933-16-3	**	10.60	PE	5485
B₁C₂H₁Br₂⁺	C ₂ B ₁ H ₁ Br ₂ (1,6-Dicarbahexaborane(6),2,4-dibromo-)	XXXXXX-XX-X	**	9.17 (V)	PE	5553
N₃Br⁺	BrN ₃	13973-87-0	**	10.00±0.01	PE	5001
H₂NBr⁺	NH ₂ Br	14519-10-9	**	10.18±0.04 (V)	PE	4947
HNBr₂⁺	NHBr ₂	14519-03-0	**	10.1±0.2 (V)	PE	4948
C₃NBr⁺	CBr≡CCN	3114-46-3	**	10.71±0.02	PE	4765
CH₄NBr⁺	CH ₃ NHBr	10218-87-8	** **	9.67 (V) 9.12	PE PE	4775 5329
C₂H₂NBr⁺	CH ₂ BrCN	590-17-0	**	11.28 (V)	PE	4684
C₂H₆NBr⁺	(CH ₃) ₂ NBr	10218-90-3	** **	9.15 (V) 8.61	PE PE	5304 5329
C₅H₄NBr⁺	C ₅ H ₄ NBr (Pyridine, 2-bromo-) C ₅ H ₄ NBr (Pyridine, 3-bromo-) C ₅ H ₄ NBr (Pyridine, 4-bromo-)	109-04-6 626-55-1 1120-87-2	** ** **	9.7±0.1 9.75±0.1 9.95±0.1	EI EI EI	4302 4302 4302
C₅H₁₀NBr⁺	C ₅ H ₁₀ NBr (Piperidine,1-bromo-)	60094-06-6	**	8.92±0.10 (V)	PE	5308
C₆H₆NBr⁺	C ₆ H ₅ BrNH ₂ (Benzenamine, 2-bromo-) C ₆ H ₄ BrNHCOCH ₃ (Acetamide, <i>N</i> -(2-bromophenyl)-) C ₆ H ₄ BrNHCOCH ₃ (Acetamide, <i>N</i> -(4-bromophenyl)-)	615-36-1 614-76-6 103-88-8	** CH ₂ =C=O CH ₂ =C=O	8.45 11.17±0.03 10.56±0.03	EI EI EI	4834 3483 3483
C₇H₁₂NBr⁺	C ₇ H ₁₂ NBr (1-Azabicyclo[2.2.2]octane, 4-bromo-)	2181-19-3	**	8.46±0.015 (V)	PE	4286
C₈H₁₁NBr⁺	C ₈ H ₁₁ NBr (8-Azabicyclo[3.2.1]octane,3-bromo-8-methyl- <i>exo</i> -)	2292-11-7	**	7.8±0.15	EI	5401
C₁₃H₁₀NBr⁺	C ₆ H ₄ BrC(=CH ₂)C ₅ H ₄ N (Pyridine,2-[1-(2-bromophenyl)ethenyl]-) C ₆ H ₄ BrC(=CH ₂)C ₅ H ₄ N (Pyridine,2-[1-(4-bromophenyl)ethenyl]-)	XXXXXX-XX-X XXXXXX-XX-X	** **	8.6 8.62	OTH EI	5570 5570

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{13}H_{10}NBr^+$	$C_6H_4(Br)CH=CHC_5H_4N$ (Pyridine, <i>trans</i> -3-[2-(4-bromophenyl)ethenyl]-)	5847-71-2	**	8.15 ± 0.05 (V)	PE	4377
$C_9H_{10}N_2Br^+$	$C_6H_4(Br)N=CHN(CH_3)_2$ (Methanimidamide, <i>N'</i> -(2-bromophenyl)- <i>N,N</i> -dimethyl-)	53746-69-3	H	8.7	EI	4337
$C_9H_{11}N_2Br^+$	$C_6H_4(Br)N=CHN(CH_3)_2$ (Methanimidamide, <i>N'</i> -(2-bromophenyl)- <i>N,N</i> -dimethyl-)	53746-69-3	**	7.2	EI	4337
$C_{18}H_{17}N_2Br^+$	$C_6H_4(Br)C_3H_3(CN)C_6H_4N(CH_3)_2$ (Cyclopropanecarbonitrile, 1-(<i>p</i> -bromophenyl)-2-(<i>p</i> -(dimethylamino)phenyl)-)	32589-49-4	**	7.10 ± 0.05	EI	3575
$C_2H_2N_3Br^+$	$C_2H_2N_3Br$ (1H-1,2,4-Triazole,5-bromo-)	XXXXX-XX-X	**	9.9 (V)	PE	5228
$C_3H_4N_3Br^+$	$C_3HN_3Br(CH_3)$ (1H-1,2,4-Triazole,3-bromo-1-methyl-)	56616-91-2	**	9.55 (V)	PE	5228
	$C_3HN_3Br(CH_3)$ (1H-1,2,4-Triazole,5-bromo-1-methyl-)	16681-72-4	**	9.6 (V)	PE	5228
	$C_3HN_3Br(CH_3)$ (1H-1,2,4-Triazole,5-bromo-3-methyl-)	XXXXX-XX-X	**	9.6 (V)	PE	5228
	$C_2HN_3Br(CH_3)$ (4H-1,2,4-Triazole,3-bromo-4-methyl-)	16681-73-5	**	9.7 (V)	PE	5228
$C_4H_6N_3Br^+$	$C_2N_3Br(CH_3)_2$ (1H-1,2,4-Triazole,3-bromo-1,5-dimethyl-)	56616-93-4	**	9.3 (V)	PE	5228
	$C_2N_3Br(CH_3)_2$ (1H-1,2,4-Triazole,5-bromo-1,3-dimethyl-)	56616-96-7	**	9.4 (V)	PE	5228
	$C_2N_3Br(CH_3)_2$ (4H-1,2,4-Triazole,3-bromo-4,5-dimethyl-)	56616-84-3	**	9.25 (V)	PE	5228
$CH_3NBr_2^+$	CH_3NBr_2	10218-83-4	** **	9.68 (V) 9.15	PE PE	4775 5329
$C_5H_{13}NBr_2^+$	$(C_2H_5)_2NCH_2Br_2$	59777-81-0	**	10.60 (V)	PE	4564
$C_6H_5NBr_2^+$	$C_6H_4Br_2NHCOCH_3$ (Acetamide, <i>N</i> -(2,4-dibromophenyl)-)	23373-04-8	$CH_2=C=O$	10.24 ± 0.03	EI	3480
	$C_6H_4Br_2NHCOCH_3$ (Acetamide, <i>N</i> -(2,6-dibromophenyl)-)	33098-80-5	$CH_2=C=O$	10.02 ± 0.03	EI	3480
$C_6H_{15}NBr_2^+$	$(C_2H_5)_3NBr_2$	56348-00-6	**	10.60 (V)	PE	4564
$C_9H_{21}NBr_2^+$	$(n-C_3H_7)_3NBr_2$	59777-82-1	**	10.77 (V)	PE	4564
$C_{12}H_{27}NBr_2^+$	$(n-C_4H_9)_3NBr_2$	59777-83-2	**	10.66 (V)	PE	4564
$BC_5H_7NBr^+$	$C_5H_4N(Br) \cdot BH_3$ (Pyridine, 4-bromo-, compound with borane (1:1))	56898-53-4	**	9.71 (V)	PE	4536

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
BC₁H₁₂N₂Br⁺	((CH ₃) ₂ N) ₂ BBr	6990-27-8	** **	8.13	PE	3584
				8.16 (V)	PE	3704
BC₂H₆NBr⁺	(CH ₃) ₂ NBBR	7360-64-7	** **	9.55 (V)	PE	3704
				9.60	PE	3584
B₂C₁H₁₂N₂Br⁺	(BrCH ₂ BNCH ₃) ₂	73775-15-2	**	9.58 (V)	PE	5628
B₂C₃H₉N₃Br⁺	N ₃ B ₂ Br ₂ (CH ₃) ₄ (1,2,4,3,5-Triazadiborolidine, 3,5-dibromo-1,2,4-trimethyl-)	53246-10-9	**	8.14 (V)	PE	4526
OBr⁺ (X ¹ Σ ⁻)	BrO(X ² Π _{1/2})	14380-62-2	**	10.29±0.01 (V)	PE	5222
COBr⁺	CBr ₂ O	593-95-3	**	11.0 (V)	PE	3726
C₂O₂Br⁺	(COBr) ₂	15219-34-8	**	10.49±0.1	PE	4696
C₂H₃OBr⁺	CH ₃ CBrO	506-96-7	**	10.68±0.05 (V)	PE	4220
C₂H₃OBr⁺	CH ₂ BrCH ₂ OH-gauche <i>trans</i> -CH ₂ BrCH ₂ OH	XXXXXX-XX-X	**	10.75 (V)	PE	5088
				10.65 (V)	PE	5088
C₃H₇OBr⁺	CH ₂ BrCH ₂ OCH ₃ -gauche <i>trans</i> -CH ₂ BrCH ₂ OCH ₃	XXXXXX-XX-X	**	10.13 (V)	PE	5088
				10.20 (V)	PE	5088
C₄H₅OBr⁺	C ₄ H ₅ OBr (Furan, 3-bromo-)	22037-28-1	**	9.14	CTS	4382
C₅H₉OBr⁺	C ₅ H ₉ (Br)OH (Cyclopentanol, 2-bromo-, <i>cis</i> -)	28435-62-3	**	10.19±0.02	PE	4003
C₅H₉OBr⁺	C ₅ H ₉ (Br)OH (Cyclopentanol, 2-bromo-, <i>trans</i> -)	20377-79-1	**	10.11±0.02	PE	4003
C₆H₅OBr⁺	C ₆ H ₅ BrOCH ₃ (Benzene, 1-bromo-3-methoxy-)	2398-37-0	CH ₃	12.29±0.1	EI	3446
	C ₆ H ₅ BrOCH ₃ (Benzene, 1-bromo-4-methoxy-)	104-92-7	CH ₃	11.89±0.1	EI	3446
	C ₆ H ₅ BrNO ₂ (Benzene, 1-bromo-3-nitro-)	585-79-5	NO	10.26±0.1	EI	3447
C₆H₅OBr⁺	C ₆ H ₅ (OH)Br (Phenol, 2-bromo-)	95-56-7	**	9.09±0.1	EI	3553
	C ₆ H ₅ BrOOCCH ₃ (Phenol, 2-bromo-, acetate)	1829-37-4	CH ₂ =C=O	9.62±0.03	EI	3483
C₆H₅OBr⁺	C ₆ H ₅ BrOOCCH ₃ (Phenol, 3-bromo-, acetate)	35065-86-2	CH ₂ =C=O	10.02±0.2	EI	3484

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₆H₅OBr⁺	C ₆ H ₅ BrOOCCH ₃ (Phenol, 4-bromo-, acetate)	1927-95-3	CH ₂ =C=O	9.84±0.03	EI	3483
			CH ₂ =C=O	10.08±0.2	EI	3484
C₇H₄OBr⁺	C ₆ H ₄ (Br)COOH (Benzoic acid, 3-bromo-)	585-76-2	OH	12.23±0.2	EI	3973
			OH	12.34±0.2	EI	3973
C₇H₅OBr⁺	C ₆ H ₄ BrOCH ₃ (Benzene, 1-bromo-3-methoxy-)	2398-37-0	**	8.69±0.1	EI	3446
			**	8.11	PE	4621
	C ₆ H ₄ (Br)OCH ₃ (Benzene, 1-bromo-4-methoxy-)	104-92-7	**	8.39±0.1	EI	3446
C₈H₇OBr⁺	C ₆ H ₄ Br(COCH ₃) (Ethanone, 1-(4-bromophenyl)-)	99-90-1	**	9.0±0.1	PE	4401
C₈H₉OBr⁺	C ₆ H ₅ OCH ₂ CH ₂ Br (Benzene, 2-bromoethoxy-)	589-10-6	**	8.42	EI	5083
			**	8.49±0.05	EI	5484
C₉H₁₂OBr⁺	C ₆ H ₅ OC ₃ H ₇ Br (Benzene, (3-bromopropoxy)-)	XXXXX-XX-X	**	8.56±0.05	EI	5484
C₁₀H₁₁OBr⁺	C ₆ H ₅ OC ₄ H ₉ Br (Benzene, 4-bromobutoxy)-)	XXXXX-XX-X	**	8.54±0.05	EI	5484
C₁₁H₁₆OBr⁺	C ₆ H ₅ OC ₅ H ₁₁ Br (Benzene, [(5-bromopentyl)oxy]-)	XXXXX-XX-X	**	8.59±0.05	EI	5484
C₁₂H₁₈OBr⁺	C ₆ H ₅ OC ₆ H ₁₃ Br (Benzene, [(6-bromohexyl)oxy]-)	XXXXX-XX-X	**	8.60±0.05	EI	5484
C₂H₃O₂Br⁺	CH ₂ BrCOOH	79-08-3	**	11.0 (V)	PE	3874
C₇H₅O₂Br⁺	C ₆ H ₄ (Br)COOH (Benzoic acid, 3-bromo-)	585-76-2	**	9.66±0.2	EI	3973
			**	9.72±0.2	EI	3973
C₇H₁₁O₂Br⁺	C ₅ H ₉ (Br)OCOCH ₃ (Cyclopentanol, 2-bromo-, acetate, <i>cis</i> -)	53093-41-7	**	10.00±0.02	PE	4003
			**	10.07±0.02	PE	4003
C₈H₇O₂Br⁺	C ₆ H ₄ BrOOCCH ₃ (Phenol, 2-bromo-, acetate)	1829-37-4	**	8.66±0.03	EI	3483
			**	8.79±0.2	EI	3484

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₆H₇O₂Br⁺	C ₆ H ₃ BrOOCCH ₃ (Phenol, 4-bromo-, acetate)	1927-95-3	**	8.42 ± 0.03	EI	3483
			**	8.61 ± 0.2	EI	3484
C₆H₃OBr₂⁺	C ₆ H ₃ Br ₂ OOCCH ₃ (Phenol, 2,4-dibromo-, acetate)	36914-79-1	CH ₂ =C=O	9.45 ± 0.03	EI	3480
	C ₆ H ₃ Br ₂ OOCCH ₃ (Phenol, 2,6-dibromo-, acetate)	28165-72-2	CH ₂ =C=O	9.74 ± 0.03	EI	3480
C₈H₆O₂Br₂⁺	C ₆ H ₃ Br ₂ OOCCH ₃ (Phenol, 2,4-dibromo-, acetate)	36914-79-1	**	8.21 ± 0.03	EI	3480
	C ₆ H ₃ Br ₂ OOCCH ₃ (Phenol, 2,6-dibromo-, acetate)	28165-72-2	**	8.42 ± 0.03	EI	3480
NOBr⁺ (² A', ² A'') (² A', ² A'')	NOBr	13444-87-6	**	10.17	PE	4404
			**	10.20 ± 0.05	PE	4420
CNOBr⁺	BrNCO	3644-72-2	**	10.46 ± 0.01	PE	5001
CNOBr₃⁺	CBr ₃ NO	XXXXX-XX-X		9.96 ± 0.05 (V)	PE	5298
C₅H₄NOBr⁺	C ₅ H ₄ N(O)Br (Pyridine, 4-bromo-, 1-oxide)	14248-50-1	**	8.44 (V)	PE	4222
C₆H₁₂NOBr⁺	C ₆ H ₁₂ NOBr	52761-86-1	**	9.06 ± 0.1 (V)	PE	4465
C₈H₇NOBr⁺	C ₆ H ₃ Br ₂ NHCOCH ₃ (Acetamide, N-(2,4-dibromophenyl)-)	23373-04-8		8.84 ± 0.03	EI	3480
	C ₆ H ₃ Br ₂ NHCOCH ₃ (Acetamide, N-(2,6-dibromophenyl)-)	33098-80-5		8.88 ± 0.03	EI	3480
C₈H₈NOBr⁺	C ₆ H ₄ BrNHCOCH ₃ (Acetamide, N-(2-bromophenyl)-)	614-76-6	**	8.50	EI	4834
			**	8.17 ± 0.03	EI	3483
	C ₆ H ₄ BrNHCOCH ₃ (Acetamide, N-(4-bromophenyl)-)	103-88-8	**	8.17 ± 0.03	EI	3483
C₁₂H₈NOBr⁺	C ₆ H ₄ BrCOC ₅ H ₄ N (Methanone, (2-bromophenyl)-2-pyridinyl-)	XXXXX-XX-X	**	8.93	EI	5459
C₁H₃N₂OBr⁺	C ₁ H ₃ N ₂ Br(=O) (2(1H)-Pyrimidinone, 5-bromo-)	38353-06-9	**	9.47 ± 0.05	EI	5159
C₅H₅N₂OBr⁺	C ₁ H ₂ N ₂ BrOCH ₃ (Pyrimidine, 5-bromo-2-methoxy-)	14001-66-2	**	9.11 ± 0.05	EI	5159
	C ₁ H ₂ N ₂ Br(=O)CH ₃ (2(1H)Pyrimidinone, 5-bromo-1-methyl-)	14248-01-2	**	8.78 ± 0.05	EI	5159

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₇H₇N₂OBr⁺						
	C ₆ H ₇ BrNHCONH ₂ (Urea, (2-bromophenyl)-)	13114-90-4	**	8.45	EI	4834
C₅H₄NO₂Br⁺						
	C ₄ H ₄ N(Br)(=O) ₂ (2,5-Pyrrolidinedione, 1-bromo-)	128-08-5	**	10.12 (V)	PE	4742
			**	10.12 (V)	PE	4810
C₅H₈NO₂Br⁺						
	C ₄ H ₂ NO(=O)(Br)(CH ₃) ₂ (2-Oxazolidinone, 3-bromo-4,4-dimethyl-)	60491-95-4	**	9.45 (V)	PE	4742
C₆H₄NO₂Br⁺						
	C ₆ H ₄ BrNO ₂ (Benzene, 1-bromo-3-nitro-)	585-79-5	**	9.82±0.1	EI	3447
	C ₆ H ₄ BrNO ₂ (Benzene, 1-bromo-4-nitro-)	586-78-7	**	9.76±0.1	EI	3447
C₁₁H₁₆NO₂Br⁺						
	C ₁₁ H ₁₆ NO ₂ Br (Benzeneethanamine, 4-bromo-2,5-dimethoxy- α -methyl-(\pm)-)	64638-07-9	**	7.94±0.06	PE	4758
C₈H₇NOBr₂⁺						
	C ₆ H ₄ Br ₂ NHCOCH ₃ (Acetamide, <i>N</i> -(2,4-dibromophenyl)-)	23373-04-8	**	8.08±0.03	EI	3480
	C ₆ H ₄ Br ₂ NHCOCH ₃ (Acetamide, <i>N</i> -(2,6-dibromophenyl)-)	33098-80-5	**	8.32±0.03	EI	3480
FBr⁺ (² $\Pi_{3/2}$) (² $\Pi_{1/2}$) (² $\Pi_{1/2}$) (² $\Pi_{1/2}$) (² Π , ² Σ)	BrF	13863-59-7	** ** ** ** **	11.77±0.01 11.78±0.01 12.09±0.01 12.10±0.01 15.92±0.01 (V)	PE PE PE PE PE	4755 3680 3680 4755 4755
F₃Br⁺	BrF ₃	7787-71-5	**	12.15±0.04	PE	3680
F₃Br⁺	BrF ₃	7789-30-2	**	13.172±0.005	PE	3655
CF₃Br⁺	CF ₃ Br	75-63-8	** ** **	12.0 (V) 12.08±0.05 (V) 12.12±0.02 (V)	PE PE PE	3914 4727 4026
C₂F₃Br⁺	C ₂ F ₃ Br	598-73-2	** **	9.67 10.11 (V)	PE PE	3589 4303
C₃F₃Br⁺	CF ₃ C \equiv CBr	819-01-2	**	10.81±0.02	PE	4765
C₆F₅Br⁺	C ₆ F ₅ Br (Benzene, bromopentafluoro-)	344-04-7	** **	9.57 (V) 9.67±0.02	PE PE	5252 5305
CF₂Br₂⁺	CF ₂ Br ₂	75-61-6	**	11.18 (V)	PE	5470

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_2F_4Br_2^+$	$(CF_3Br)_2$	124-73-2	**	11.44 ± 0.01 (V)	PE	4613
$C_6F_4Br_2^+$	$C_6F_4Br_2$ (Benzene, 1,2-dibromo-3,4,5,6-tetrafluoro-)	827-08-7	**	9.50 ± 0.02	PE	5305
	$C_6F_4Br_2$ (Benzene, 1,3-dibromo-2,4,5,6-tetrafluoro-)	27516-63-8	**	9.45 ± 0.02	PE	5305
	$C_6F_4Br_2$ (Benzene, 1,4-dibromo-2,3,5,6-tetrafluoro-)	344-03-6	**	9.42 ± 0.02	PE	5305
$CFBr_3^+$	$CFBr_3$	353-54-8	**	10.67 ± 0.01	PE	4365
$C_6F_3Br_3^+$	$C_6F_3Br_3$ (Benzene, 1,3,5-tribromo-2,4,6-trifluoro-)	XXXXX-XX-X	**	9.33 ± 0.02	PE	5305
$C_2H_2FBr^+$	<i>cis</i> -CHF=CHBr	2366-31-6	**	9.75 (V)	PE	4303
$C_2H_4FBr^+$	CH_2FCH_2Br	762-49-2	**	10.57 (V)	PE	4482
$C_3H_6FBr^+$	$CH_2FCH_2CH_2Br$	352-91-0	**	10.38 (V)	PE	4482
	CH_3CHFCH_2Br	1871-72-3	**	10.44 (V)	PE	4482
$C_1H_8FBr^+$	$CH_3CH_2CHFCH_2Br$	1871-73-4	**	10.32 (V)	PE	4482
	$(CH_3)_2CFCH_2Br$	19869-78-4	**	10.28 (V)	PE	4482
	$CH_3CHFCHBrCH_3$ (erythro)	57302-15-5	**	10.91 (V)	PE	4482
	$CH_3CHFCHBrCH_3$ (threo)	5780-13-2	**	10.21 (V)	PE	4482
$C_3H_8FBr^+$	C_3H_8FBr (Cyclopentane, 1-bromo-2-fluoro-, <i>cis</i> -)	51422-72-1	**	10.10 ± 0.02	PE	4003
	C_3H_8FBr (Cyclopentane, 1-bromo-2-fluoro-, <i>trans</i> -)	51422-73-2	**	10.25 ± 0.02	PE	4003
$C_6H_4FBr^+$	C_6H_4FBr (Benzene, 1-bromo-2-fluoro-)	1072-85-1	**	9.11 ± 0.02	PE	5305
			**	9.14 (V)	PE	4567
	C_6H_4FBr (Benzene, 1-bromo-3-fluoro-)	1073-06-9	**	9.11 ± 0.02	PE	5305
			**	9.25 (V)	PE	4567
	C_6H_4FBr (Benzene, 1-bromo-4-fluoro-)	460-00-4	**	9.02 ± 0.02	PE	5305
			**	9.03 (V)	PE	4567
$C_6H_{10}FBr^+$	$C_6H_{10}FBr$ (Cyclohexane, 1-bromo-2-fluoro-, <i>cis</i> -)	51422-74-3	**	10.04 ± 0.02	PE	4003
			**	10.06 (V)	PE	4482
	$C_6H_{10}FBr$ (Cyclohexane, 1-bromo-2-fluoro-, <i>trans</i> -)	17170-96-6	**	10.18 ± 0.02	PE	4003
			**	10.05 (V)	PE	4482
$C_{12}H_8FBr^+$	$C_6H_4(Br)C_6H_4F$ (1,1'-Biphenyl, 4-bromo-4'-fluoro-)	398-21-0	**	8.10 ± 0.02	PE	3702

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₆H₃F₂Br⁺	C ₆ H ₃ F ₂ Br (Benzene, 1-bromo-2,4-difluoro-)	348-57-2	**	9.16±0.02	PE	5305
	C ₆ H ₃ F ₂ Br (Benzene, 2-bromo-1,4-difluoro-)	399-94-0	**	9.18±0.02	PE	5305
	C ₆ H ₃ F ₂ Br (Benzene, 4-bromo-1,2-difluoro-)	348-61-8	**	9.19±0.02	PE	5305
C₆H₂F₃Br⁺	C ₆ H ₂ F ₃ Br (Benzene, 1-bromo-2,4,5-trifluoro-)	327-52-6	**	9.25±0.02	PE	5305
	C ₆ H ₂ F ₃ Br (Benzene, 2-bromo-1,3,5-trifluoro-)	2367-76-2	**	9.34±0.02	PE	5305
C₇H₁F₃Br⁺	C ₆ H ₁ BrCF ₃ (Benzene, 1-bromo-2-trifluoromethyl-)	392-83-6	**	9.38 (V)	PE	4567
	C ₆ H ₁ BrCF ₃ (Benzene, 1-bromo-3-trifluoromethyl-)	401-78-5	**	9.36 (V)	PE	4567
	C ₆ H ₁ BrCF ₃ (Benzene, 1-bromo-4-trifluoromethyl-)	402-43-7	**	9.48 (V)	PE	4567
C₆HF₄Br⁺	C ₆ HF ₄ Br (Benzene, 1-bromo-2,3,4,5-tetrafluoro-)	1074-91-5	**	9.50±0.02	PE	5305
	C ₆ HF ₄ Br (Benzene, 2-bromo-1,3,4,5-tetrafluoro-)	1559-86-0	**	9.46±0.02	PE	5305
	C ₆ HF ₄ Br (Benzene, 3-bromo-1,2,4,5-tetrafluoro-)	1559-88-2	**	9.45±0.02	PE	5305
C₆H₃FBr₂⁺	C ₆ H ₃ FBr ₂ (Benzene, 2,4-dibromo-1-fluoro-)	XXXXX-XX-X	**	9.05±0.02	PE	5305
C₂H₂F₂Br₂⁺	CF ₂ BrCH ₂ Br	75-82-1	**	10.86±0.01 (V)	PE	4613
C₆H₂F₂Br₂⁺	C ₆ H ₂ F ₂ Br ₂ (Benzene, 1,2-dibromo-4,5-difluoro-)	XXXXX-XX-X	**	9.13±0.02	PE	5305
	C ₆ H ₂ F ₂ Br ₂ (Benzene, 1,4-dibromo-2,5-difluoro-)	XXXXX-XX-X	**	9.09±0.02	PE	5305
C₃H₂OF₃Br⁺	CH ₂ BrCOCF ₃	431-35-6	**	10.92±0.02 (V)	PE	4524
NaBr⁺	NaBr	7647-15-6	**	8.31±0.1	PE	4344
			**	8.31±0.1	PE	5035
			**	8.7 (V)	PE	4307
			**	9.45±0.04 (V)	PE	5035
AlBr⁺	AlBr	22359-97-3	**	9.3	PE	4860
AlBr₃⁺	AlBr ₃	7727-15-3	**	10.91 (V)	PE	4398
			**	10.91 (V)	PE	4256
Al₂Br₆⁺	(AlBr ₃) ₂	18898-34-5	**	10.97 (V)	PE	4559
			**	10.97 (V)	PE	4256

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_2H_6AlBr^+$	$(CH_3)_2BrAl$	3017-85-4	**	9.90 (V)	PE	4398
$CH_3AlBr_2^+$	CH_3Br_2Al	3017-75-2	**	10.65 (V)	PE	4398
$C_4H_{12}Al_2Br_2^+$	$((CH_3)_2BrAl)_2$	15218-96-9	**	9.68 (V)	PE	4559
$SiBr^+$	$SiBr$	14791-57-2	** **	7.3 $9.0 \pm 1.$	S EI	3558 5166
$SiBr_2^+$	$SiBr_2$	14877-32-8	**	$12.0 \pm 1.$	EI	5166
$SiBr_3^+$	$SiBr_3$	13842-48-3	**	$12.5 \pm 1.$	EI	5166
$SiBr_4^+$	$SiBr_4$	7789-66-4	**	$14.0 \pm 1.$	EI	5166
H_3SiBr^+	SiH_3Br	13465-73-1	** ** ** **	10.90 (V) 11.03 10.96 ± 0.02 (V) 11.03 ± 0.05 (V)	PE S PE PE	3511 4697 3510 3502
$H_2SiBr_2^+$	SiH_2Br_2	13768-94-0	**	10.92 ± 0.02 (V)	PE	3510
$C_3H_9SiBr^+$	$(CH_3)_3SiBr$	2857-97-8	**	10.23 (V)	PE	4566
$C_3H_9SiBr^+$	$(CH_3)_3SiC \equiv CBr$	18243-59-9	**	9.4 ± 0.1	PE	4002
$C_9H_{13}SiBr^+$	$BrC_6H_4Si(CH_3)_3$ (Silane,(4-bromophenyl)trimethyl-)	6999-03-7	**	8.67 (V)	PE	5380
$C_8H_{18}Si_2Br_2^+$	$C_8H_{18}Si_2Br_2$	65411-95-2	**	8.83 (V)	PE	4715
$C_9H_{13}OSiBr^+$	$BrC_6H_4Si(CH_3)_2OCH_3$ (Silane,(3-bromophenyl)methoxydimethyl-)	62244-46-6	**	9.22	EI	5421
	$BrC_6H_4Si(CH_3)_2OCH_3$ (Silane,(4-bromophenyl)methoxydimethyl-)	17021-92-0	**	9.16	EI	5421
F_3SiBr^+	SiF_3Br	14049-39-9	**	12.46 ± 0.02 (V)	PE	4026
$C_7H_7FSiBr^+$	$BrC_6H_4Si(CH_3)_2F$ (Silane,(3-bromophenyl)fluorodimethyl-)	62244-54-6	CH_3	11.11	EI	5366
	$BrC_6H_4Si(CH_3)_2F$ (Silane,(4-bromophenyl)fluorodimethyl-)	62244-53-5	CH_3	10.91	EI	5366
$C_8H_{10}FSiBr^+$	$BrC_6H_4Si(CH_3)_2F$ (Silane,(3-bromophenyl)fluorodimethyl-)	62244-54-6	**	9.11	EI	5421

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization ^a or appearance potential (eV)	Method	Ref.
$C_9H_{10}FSiBr^+$	$BrC_9H_9Si(CH_3)_2F$ (Silane,(4-bromophenyl)fluorodimethyl-)	62244-53-5	**	9.01	EI	5421
PBr^+	PBr_3	7789-60-8		14.2 ± 0.2	EI	3556
PBr_2^+	PBr_4	7789-60-8	Br	11.2 ± 0.1	EI	3556
PBr_3^+	PBr_3	7789-60-8	**	9.96 (V)	PE	4023
			**	9.99 (V)	PE	5539
			**	10.0 (V)	PE	5190
			**	10.00 ± 0.03 (V)	PE	3669
			**	10.00 (V)	PE	4146
			**	10.1 ± 0.1	EI	3556
$OPBr_3^+$	$POBr_3$	7789-59-5	**	10.75 ± 0.02	PE	3835
			**	10.99 (V)	PE	4023
			**	11.03 ± 0.03 (V)	PE	3669
$CH_3O_2PBr_2^+$	$PBr_2O(OCH_3)$	63560-73-6	**	9.97 (V)	PE	4699
F_2PBr^+	PF_2Br	15597-40-7	**	11.08 ± 0.1 (V)	PE	3662
SBr_2^+	SBr_2	14312-20-0	**	9.33 ± 0.05 (V)	PE	5031
			**	9.4 (V)	PE	5466
$S_2Br_2^+$	S_2Br_2	13172-31-1	**	9.5	PE	4188
$H_9B_9SBr^+$	$SB_9H_9(Br)$ (1-Thiadecaborane(9),10-bromo-)	58568-92-6	**	9.52 (V)	PE	5324
	$SB_9H_9(Br)$ (1-Thiadecaborane(9),6-bromo-)	58575-43-2	**	9.51 (V)	PE	5324
$C_1SBr_4^+$	C_1SBr_4 (Thiophene, tetrabromo-)	3958-03-0	**	8.53 (V)	PE	4690
$C_6S_2Br_1^+$	$C_6S_2Br_1^+$ (Thieno[2,3- <i>b</i>]thiophene,2,3,4,5-tetrabromo-)	53255-86-0	**	8.39 (V)	PE	5478
$C_1H_3SBr^+$	C_1H_3SBr (Thiophene, 2-bromo-)	1003-09-4	**	8.60 (V)	PE	4690
			**	8.664 ± 0.005	PE	3911
			**	8.664	PE	3645
			**	8.82 ± 0.05 (V)	PE	4626
			**	8.93 ± 0.05	EI	3482
			**	8.80	CTS	3787
	C_1H_3SBr (Thiophene, 3-bromo-)	872-31-1	**	8.812 ± 0.005	PE	3911
			**	8.812	PE	3645
			**	8.97 (V)	PE	4690
			**			

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₇H₃SBr⁺	C ₇ H ₃ SBr	872-31-1	**	9.02 ± 0.05	EI	3482
			**	8.87	CTS	4382
C₇H₇SBr⁺	C ₆ H ₅ (Br)SCH ₃ (Benzene, 1-bromo-4-(methylthio)-)	104-95-0	**	8.17 ± 0.05 (V)	PE	4627
C₆H₃S₂Br⁺	C ₆ H ₃ S ₂ Br (Thieno[2,3- <i>b</i>]thiophene, 2-bromo-)	25121-81-7	**	8.35 (V)	PE	5478
	C ₆ H ₃ S ₂ Br (Thieno[2,3- <i>b</i>]thiophene, 3-bromo-)	25121-84-0	**	8.43 (V)	PE	5478
C₁H₂SBr₂⁺	C ₁ H ₂ SBr ₂ (Thiophene, 2,5-dibromo-)	3141-27-3	**	8.49 (V)	PE	4690
	C ₁ H ₂ SBr ₂ (Thiophene, 3,4-dibromo-)	3141-26-2	**	8.94 (V)	PE	4690
C₆H₂S₂Br₂⁺	C ₆ H ₂ S ₂ Br ₂ (Thieno[2,3- <i>b</i>]thiophene, 2,5-dibromo-)	25121-86-2	**	8.19 (V)	PE	5478
	C ₆ H ₂ S ₂ Br ₂ (Thieno[2,3- <i>b</i>]thiophene, 3,4-dibromo-)	53255-78-0	**	8.30 (V)	PE	5478
C₈H₁S₃Br₂⁺	(C ₁ H ₂ S(Br)) ₂ S (Thiophene, 2,2'-thiobis[3-bromo-])	28504-80-5	**	8.50 (V)	PE	5356
	(C ₁ H ₂ S(Br)) ₂ S (Thiophene, 2,2'-thiobis[4-bromo-])	65828-00-4	**	8.60 (V)	PE	5356
	(C ₁ H ₂ S(Br)) ₂ S (Thiophene, 3,3'-thiobis[2-bromo-])	65827-99-8	**	8.10 (V)	PE	5356
C₈H₁S₃Br₂⁺	(C ₁ H ₂ S(Br)) ₂ S (Thiophene, 3,3'-thiobis[4-bromo-])	28504-81-6	**	8.20 (V)	PE	5356
C₆HS₂Br₃⁺	C ₆ HS ₂ Br ₃ (Thieno[2,3- <i>b</i>]thiophene, 2,3,4-tribromo-)	53255-84-8	**	8.35 (V)	PE	5478
	C ₆ HS ₂ Br ₃ (Thieno[2,3- <i>b</i>]thiophene, 2,3,5-tribromo-)	53255-85-9	**	8.28 (V)	PE	5478
BC₁₂H₁₈SBr⁺	C ₆ H ₄ (Br)SB(<i>n</i> -C ₃ H ₇) ₂ (Borinic acid, dipropylthio-4-bromophenyl ester)	64503-49-7	**	8.67 ± 0.05 (V)	PE	4848
C₈H₆NSBr⁺	C ₇ H ₅ NS(Br)CH ₃ (Benzothiazole, 6-bromo-2-methyl-)	5304-21-2	**	8.55 (V)	PE	4437
C₆H₈NSBr⁺	C ₆ H ₇ BrNHCSCH ₃ (Ethanethioamide, N-(2-bromophenyl)-)	62635-46-5	**	8.05	EI	4834
C₇H₇N₂SBr⁺	C ₆ H ₅ BrNHCSNH ₂ (Thiourea, (2-bromophenyl)-)	5391-30-0	**	8.10	EI	4834
OSBr₂⁺	SOBr ₂	507-16-4	**	10.54 (V)	PE	3646
			**	10.54 (V)	PE	4295
			**	10.63 (V)	PE	3705

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
OSBr₃⁺	SOBr ₃	XXXXXX-XX-X	**	9.41±0.02	PE	3835
C₁₂H₈O₂SBr₂⁺	(C ₆ H ₄ Br) ₂ SO ₂ (Benzene, 1,1'-sulfonylbis[4-bromo-])	2050-48-8	**	8.84±0.05	PI	5040
PSBr₃⁺	PSBr ₃	3931-89-3	** **	9.82 (V) 9.89±0.03 (V)	PE PE	4023 3669
C₂H₆PSBr⁺	(CH ₃) ₃ P(S)Br	6839-93-6	**	8.18 (V)	PE	5523
CH₃PSBr₂⁺	CH ₃ P(S)Br ₂	5827-24-7	**	9.53 (V)	PE	5523
F₂PSBr⁺	F ₂ P(S)Br	13706-09-7	**	10.58 (V)	PE	5523
FPSBr₂⁺	FP(S)Br ₂	13706-10-0	**	10.23 (V)	PE	5523
CCl₂Br₂⁺	CBr ₂ Cl ₂	594-18-3	**	10.67±0.02 (V)	PE	4880
C₂H₄ClBr⁺	CH ₂ BrCH ₂ Cl	107-04-0	** ** ** ** ** ** **	10.55 10.52 10.65±0.01 (V) 10.67±0.1 (V) 10.52±0.1 (V) 10.42 10.37	PI PE PE PE PE PI PE	5501 5501 4613 4751 4751 5501 5501
C₅H₈ClBr⁺	C ₅ H ₈ ClBr (Cyclopentane, 1-bromo-2-chloro-, <i>cis</i> -)	37722-39-7	**	10.13±0.02	PE	4003
	C ₅ H ₈ ClBr (Cyclopentane, 1-bromo-2-chloro-, <i>trans</i> -)	14376-82-0	**	10.23±0.02	PE	4003
C₆H₁₀ClBr⁺	C ₆ H ₁₀ ClBr (Cyclohexane, 1-bromo-2-chloro-, <i>cis</i> -)	51422-75-4	**	10.03±0.02	PE	4003
	C ₆ H ₁₀ ClBr (Cyclohexane, 1-bromo-2-chloro-, <i>trans</i> -)	13898-96-9	**	10.13±0.02	PE	4003
CNOCl₂Br⁺	CCl ₂ BrNO	XXXXXX-XX-X		10.22±0.05 (V)	PE	5298
CNOClBr₂⁺	CClBr ₂ NO	XXXXXX-XX-X		10.02±0.05 (V)	PE	5298
CF₂ClBr⁺	CF ₂ BrCl	353-59-3	**	11.83 (V)	PE	5470
PClBr⁺	PClBr ₂	13550-32-8	Br	11.3±0.1	EI	3556
PCl₂Br⁺	PCl ₂ Br	13536-48-6	**	10.4±0.1	EI	3556

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
PClBr₂⁺	PClBr ₂	13550-32-8	**	10.2±0.1	EI	3556
KBr⁺	KBr	7758-02-3	**	7.85±0.1	PE	4344
(²P _{3/2})			**	7.85±0.1	PE	5035
(²P _{3/2})			**	8.1 (V)	PE	4307
(²P _{1/2})			**	8.82±0.04 (V)	PE	5035
CaBr⁺	CaBr	10024-43-8	**	5.6	PE	4860
TiBr₁⁺	TiBr ₁	7789-68-6	**	10.55 (V)	PE	5148
			**	10.59 (V)	PE	4694
C₁₀H₁₀TiBr₂⁺	(η-C ₅ H ₅) ₂ TiBr ₂ (Titanium dibromobis(η ⁵ -2,4-cyclopentadien-1-yl)-)	1293-73-8	**	8.8±0.1 (V)	PE	4987
C₁₀H₁₁NO₅CrBr⁺	(BrC ₅ H ₄ N)(CO) ₅ Cr (Chromium,(4-bromopyridine)pentacarbonyl-(OC-6-22)-)	64914-27-8	**	7.37 (V)	PE	5566
C₃O₃PCrBr₃⁺	(PBr ₃)(CO) ₅ Cr	22466-06-4	**	8.32 (V)	PE	5539
C₃O₃MnBr⁺	(CO) ₅ MnBr	14516-54-2	**	8.83±0.05 (V)	PE	4492
			**	8.86 (V)	PE	3866
C₆H₃NO₁MnBr⁺	<i>cis</i> -(CO) ₄ (CCH ₃)MnBr	37474-14-9	**	8.26 (V)	PE	3866
C₇H₅O₂PMnBr₃⁺	(C ₅ H ₅)(PBr ₃)(CO) ₂ Mn (Manganese,dicarbonyl(η ⁵ -2,4-cyclopentadien-1-yl) (phosphorus tribromide)-)	XXXXX-XX-X	**	8.01	EI	5453
C₁O₁FeBr₂⁺	(CO) ₄ FeBr ₂	18475-84-8	**	8.68 (V)	PE	4431
C₇H₅O₂FeBr⁺	C ₅ H ₅ (CO) ₂ FeBr (Iron, bromodicarbonyl (η ⁵ -2,4-cyclopentadien-1-yl)-)	12078-20-5	**	7.93 (V)	PE	4570
			**	7.95 (V)	PE	4565
C₆H₂O₁FeBr₂⁺	<i>trans</i> -C ₂ H ₂ Br ₂ (CO) ₄ Fe	52646-68-1	**	8.74 (V)	PE	4908
C₁₅H₁₈O₆CoBr₃⁺	(C ₅ H ₇ O ₂ Br) ₃ Co (Cobalt, tris(3-bromo-2,4-pentanedionato-0,0')-(OC-6-11)-)	15218-44-7	**	7.58 (V)	PE	4965
Cu₃Br₃⁺	Cu ₃ Br ₃	37190-22-0	**	9.7	EI	3954
			**	9.50±0.02 (V)	PE	4839
Cu₁Br₃⁺	Cu ₁ Br ₁	XXXXX-XX-X		10.4	EI	3954
Cu₁Br₁⁺	Cu ₁ Br ₁	XXXXX-XX-X	**	9.2	EI	3954

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
ZnBr₂⁺						
(² Π _{3/2g})	ZnBr ₂	7699-45-8	**	10.89±0.05 (V)	PE	3833
(² Π _{1/2g})			**	11.22±0.05 (V)	PE	3833
(² Π _u)			**	11.40±0.05 (V)	PE	3833
(² Σ _u)			**	12.28±0.05 (V)	PE	3833
(² Σ _g)			**	13.55±0.05 (V)	PE	3833
(² Π _{3/2g})			**	10.8 (V)	PE	3963
(² Π _{3/2g})			**	10.90 (V)	PE	4232
(² Π _{3/2u})			**	11.1 (V)	PE	3963
(² Π _{1/2g})			**	11.2 (V)	PE	3963
(² Π _{1/2g})			**	11.285 (V)	PE	4232
(² Π _{1/2u})			**	11.4 (V)	PE	3963
(² Π _{3/2u})			**	11.46 (V)	PE	4232
(² Π _{1/2u})			**	11.625 (V)	PE	4232
(² Σ _u)			**	12.3 (V)	PE	3963
(² Σ _u)			**	12.33 (V)	PE	4232
(² Σ _g)			**	13.0 (V)	PE	3963
(² Σ _g)			**	13.55 (V)	PE	4232
(² D _{5/2})			**	18.89 (V)	PE	4232
(² D _{3/2})			**	19.19 (V)	PE	4232
GaBr₃⁺						
	GaBr ₃	13450-88-9	**	10.40	PE	4215
			**	10.94 (V)	PE	4398
			**	10.94 (V)	PE	4256
H₃GeBr⁺						
	GeH ₃ Br	13569-43-2	**	10.72±0.05 (V)	PE	3502
H₂GeBr₂⁺						
	GeH ₂ Br ₂	13769-36-3	**	10.69±0.02 (V)	PE	3510
C₁₈H₁₅GeBr⁺						
	(C ₆ H ₅) ₃ GeBr (Germane, bromotriphenyl-)	3005-32-1	**	9.17±0.05 (V)	PE	4620
AsBr⁺						
	AsBr ₃	7784-33-0		12.5±0.2	EI	5016
AsBr₂⁺						
	AsBr ₃	7784-33-0	Br ⁻	8.4±0.2	EI	5016
AsBr₃⁺						
	AsBr ₃	7784-33-0	**	10.19 (V)	PE	5473
			**	10.21±0.04 (V)	PE	4635
			**	8.7±0.05	EI	5016
SeBr₂⁺						
	SeBr ₂	22987-45-7	**	9.07 (V)	PE	5074
			**	9.17±0.05 (V)	PE	5031
Kr⁺						
(² P _{3/2} ^o)	Kr	7439-90-9	**	13.9997±0.00001	S	5162
(² P _{3/2})			**	14.0010±0.0012	S	3881
(² P _{1/2})			**	14.6655±0.00002	S	5162
(² P _{3/2})			**	13.992±0.002	PE	3525
(² P _{1/2})			**	14.661±0.002	PE	3525
(² P _{3/2})			**	13.974±0.004	PEN	3541
	KrF ₂	13773-81-4	F+F ⁻	11.517	PI	4998
Kr⁺²						
	Kr	7439-90-9	**	38.4±0.2	EI	4503
Kr₂⁺						
	Kr ₂	12596-40-6	**	12.86±0.015	PI	4923
(1/2)u			**	13.76±0.02 (V)	PE	4885

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.	
Kr₂⁺ (3/2) _g (1/2) _u	Kr ₂	12596-40-6	**	13.90±0.015 (V)	PE	4885	
			**	14.57±0.015 (V)	PE	4885	
			**	13.45±0.3	EI	5350	
FKr⁺	KrF ₂	13773-81-4	F	~ 13.38	PI	4998	
F₂Kr⁺ (² Π _u) (² Π _{3/2u}) (² Π _{1/2u}) (² Σ _g ⁺) (² Σ _g ⁻) (² Π _g) (² Π _u) (² Π _u) (² Π _u) (² Σ _u ⁺) (² Σ _u ⁻) (² Σ _g ⁺)	KrF ₂	13773-81-4	**	13.06-13.16	PE	3642	
			**	13.34 (V)	PE	3501	
			**	13.47 (V)	PE	3501	
			**	13.75	PE	3642	
			**	13.90 (V)	PE	3501	
			**	14.0	PE	3642	
			**	14.37 (V)	PE	3501	
			**	16.25	PE	3642	
			**	16.92 (V)	PE	3501	
			**	17.7 (V)	PE	3501	
			**	17.7 (V)	PE	3642	
			**	23.0 (V)	PE	3501	
ArKr⁺	KrAr	51184-77-1	**	13.425±0.02	PI	4926	
			**	14.0±0.2	EI	5350	
Rb⁺	Rb	7440-17-7	**	4.18	PE	4642	
	RbOH	1310-82-3	OH	~ 10	EI	3461	
	RbCl	7791-11-9	Cl	8.695±0.03	PI	3536	
			Cl ⁻	21.17±0.04 (V)	PE	5035	
	(3P _{3/2}) (3P _{1/2})	RbBr	7789-39-1	Br	22.00±0.04 (V)	PE	5035
				Br ⁻	8.12±0.03	PI	3536
	(3P _{3/2}) (3P _{1/2})	RbI	7790-29-6	I	21.10±0.04 (s)	PE	5035
				I ⁻	21.77±0.04 (s)	PE	5035
	(3P _{3/2}) (3P _{1/2})			I	7.53±0.03	PI	3536
				I ⁻	21.33±0.04 (V)	PE	5035
				I	22.21±0.04 (V)	PE	5035
				I	9.4±0.4	EI	5239
Rb²⁺	Rb ⁺	22537-38-8	**	27.285±0.003	S	3924	
			**	27.2898±0.0001	S	5180	
NO₃Rb⁺	RbNO ₃	XXXXXX-XX-X	**	8.89±0.03 (V)	PE	5354	
O₃PRb⁺	RbPO ₃	XXXXXX-XX-X	**	9.70.0.04 (V)	PE	4840	
ClRb⁺	RbCl	7791-11-9	**	8.50±0.03	PI	3536	
			**	8.26±0.1	PE	4344	
			**	8.26±0.1	PE	5035	
			**	8.7 (V)	PE	4307	
Cl₂Rb₂⁺	(RbCl) ₂	12265-61-1	**	9.30 (V)	PE	5035	
			**	9.30 (V)	PE	4344	
AlCl₄Rb⁺	RbAlCl ₄	17992-02-8	**	10.39±0.05 (V)	PE	5238	

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
BrRb⁺	RbBr	7789-39-1	**	7.935±0.03	PI	3536
			**	7.75±0.1	PE	4344
			**	7.75±0.1	PE	5035
			**	8.0 (V)	PE	4307
			**	8.62±0.04 (V)	PE	5035
BrRb₂⁺	Rb ₂ Br ₂	12409-58-4	Br	8.485±0.05	PI	3536
Sr⁺	Sr	7440-24-6	**	5.5	PE	4860
			**	5.5±0.3	EI	5067
			**	~5.7	EI	3486
Sr⁺²	Sr	7440-24-6	**	16	EI	3486
OSr⁺	SrO	1314-11-0	**	6.5±1	EI	4881
ClSr⁺	SrCl	14989-33-4	**	5.10±0.06	EI	3526
Cl₂Sr⁺	SrCl ₂	10476-85-4	**	10.2 (V)	PE	4761
BrSr⁺	SrBr	14519-13-2	**	5.5	PE	4860
Y⁺	Y	7440-65-5	**	6.35±0.10	EI	5342
			**	6.4±0.5	EI	5349
			**	6.45±0.15	EI	4114
			**	6.5±0.5	EI	4528
			**	6.6±0.6	EI	4902
			**	6.9±0.1	EI	4147
			**	~13	EI	4147
	YO	12036-00-9				
C₂Y⁺	YC ₂	12071-35-1	**	6.0±1.0	EI	5349
OY⁺	YO	12036-00-9	**	5.85±0.15	EI	4114
			**	6.0±0.1	EI	4147
SY⁺	YS	12210-79-6	**	6.0	EI	4001
			**	6.5±0.5	EI	4528
			**	7.2±0.6	EI	4902
Zr⁺	Zr	7440-67-7	**	5.8±0.2	EI	4483
			**	6.4±0.1	EI	4114
			**	6.48±0.07	EI	5342
H₁₆B₁Zr⁺	Zr(BH ₃) ₁	12370-59-1	**	11.6±0.1 (V)	PE	4825
C₂Zr⁺	ZrC ₂	12340-54-4	**	7.5±0.5	EI	4112

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{12}H_{12}Zr^+$	$(C_7H_7)(C_5H_5)Zr$ (Zirconium, $(\eta^5\text{-cycloheptatrienylium})(\eta^5\text{-2,4-cyclopentadien-1-yl})\text{-}$)	54006-95-0	**	6.94 ± 0.05 (V)	PE	4428
$C_{20}H_{14}Zr^+$	$((CH_3)_3CCH_2)_4Zr$	38010-72-9	**	8.33 ± 0.1 (V)	PE	4242
$C_8H_{21}N_4Zr^+$	$(N(CH_3)_2)_4Zr$	XXXXXX-XX-X	**	7.23 (V)	PE	4588
$C_{16}H_{10}N_4Zr^+$	$(N(C_2H_5)_2)_4Zr$	XXXXXX-XX-X	**	6.76 (V)	PE	4588
OZr^+	ZrO	12036-01-0	**	5.8 ± 0.2	EI	4483
			**	6.2 ± 0.1	EI	4114
O_2Zr^+	ZrO ₂	1314-23-4	**	9.4 ± 0.2	EI	4483
			**	9.55 ± 0.1	EI	4114
$C_{20}H_{28}O_8Zr^+$	$((CH_3CO)_2CH)_4Zr$	17501-44-9	**	7.95 (V)	PE	5338
$C_{16}H_{14}Si_4Zr^+$	$((CH_3)_3SiCH_2)_4Zr$	32665-18-2	**	8.64 ± 0.1 (V)	PE	4242
$ClZr^+$	ZrCl ₄	10026-11-6		21.9	EI	3783
Cl_2Zr^+	ZrCl ₄	10026-11-6		16.8	EI	3783
Cl_3Zr^+	ZrCl ₄	10026-11-6		12.3	EI	3783
Cl_4Zr^+	ZrCl ₄	10026-11-6	**	11.94 (V)	PE	4694
			**	10.6	EI	3783
$C_{10}H_{10}Cl_2Zr^+$	$(\eta\text{-}C_5H_5)_2ZrCl_2$ (Zirconium, dichlorobis($\eta^5\text{-2,4-cyclopentadien-1-yl})\text{-}$)	1291-32-3	**	8.6 ± 0.1 (V)	PE	4987
			**	8.60 ± 0.05 (V)	PE	4375
$C_{20}H_{30}Cl_2Zr^+$	$(C_5(CH_3)_5)_2ZrCl_2$ (Zirconium, dichlorobis[(1,2,3,4,5)- η]-1-(1-ethylpropyl)- 2,4-cyclopentadien-1-yl]-)	58628-41-4	**	7.55 (V)	PE	5560
Br_4Zr^+	$ZrBr_4$ (JC—Mean value of Jahn–Teller components)	13777-25-8	**	10.86 (V)	PE	4694
$C_{10}H_{10}Br_2Zr^+$	$(\eta\text{-}C_5H_5)_2ZrBr_2$ (Zirconium dibromobis($\eta^5\text{-2,4-cyclopentadien-1-yl})\text{-}$)	1294-67-3	**	8.9 ± 0.1 (V)	PE	4987
Nb^+	Nb	7440-03-1	**	6.61 ± 0.05	EI	5342
			**	10.1 ± 1.0	EI	4900

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{12}H_{12}Nb^+$	$(C_5H_7)(C_5H_7)Nb$ (Niobium, $(\eta^7\text{-cycloheptatrienylum})(\eta^5\text{-2,4-cyclopentadien-1-yl})$ -)	54360-38-2	**	5.98 ± 0.05 (V)	PE	4428
$C_{13}H_{15}Nb^+$	$(C_5H_7)_2(CH_2CH=CH_2)Nb$ (Niobium, bis($\eta^5\text{-2,4-cyclopentadien-1-yl})(\eta^1\text{-2-propenyl})$ -)	39413-65-5	**	5.7 ± 0.1 (V)	PE	4425
$C_{10}H_{30}N_5Nb^+$	$(N(CH_3)_2)_5Nb$	XXXXXX-XX-X	**	6.77 (V)	PE	5036
$ClNb^+$	$NbCl_5$	10026-12-7		24.2	EI	3783
Cl_2Nb^+	$NbCl_5$	10026-12-7		19.5	EI	3783
Cl_3Nb^+	$NbCl_5$	10026-12-7		14.6	EI	3783
Cl_4Nb^+	$NbCl_5$	10026-12-7		10.7	EI	3783
Cl_5Nb^+	$NbCl_5$	10026-12-7	**	10.97 (s)	PE	4764
$C_{12}H_{11}Cl_2Nb^+$	$(\eta\text{-CH}_3C_5H_4)_2NbCl_2$ (Niobium, dichlorobis($\eta^5\text{-2,4-cyclopentadien-1-yl})$ -)	12793-14-5	**	6.4 ± 0.1 (V)	PE	4987
Mo^+	Mo	7439-98-7	**	7.10	S	4864
			**	7.0 ± 0.3	EI	4864
			**	7.22 ± 0.06	EI	5342
			**	10.5 ± 1.0	EI	4900
	$(CO)_6Mo$	13939-06-5	6CO	18.24 ± 0.06	EI	5291
	$((CH_3)_2N)_3P(CO)_5Mo$	14971-43-8		18.4 ± 0.05	EI	3952
	$((CH_3)_2N)_3P(CO)_4Mo$	27342-90-1		15.3 ± 0.05	EI	3952
	$CS(CO)_5Mo$	50358-91-3	5CO + CS	19.12 ± 0.30	EI	5291
	$MoCl_5$	10241-05-1		23.1	EI	3783
Mo_2^+	Mo_2	12596-54-2	**	8.0 ± 0.1	EI	4900
$C_{10}H_{12}Mo^+$	$(C_5H_7)_2H_2Mo$ (Molybdenum, bis($\eta^5\text{-2,4-cyclopentadien-1-yl}$)dihydro-)	1291-40-3	**	6.4 ± 0.1 (V)	PE	4425
$C_{12}H_{12}Mo^+$	$(C_6H_5)_2Mo$ (Molybdenum, bis($\eta^6\text{-benzene}$)-)	12129-68-9	**	5.52 ± 0.05 (V)	PE	4132
	$(C_5H_7)(C_5H_7)Mo$ (Molybdenum, $(\eta^7\text{-cycloheptatrienylum})(\eta^5\text{-2,4-cyclopentadien-1-yl})$ -)	12301-35-8	**	5.87 ± 0.05 (V)	PE	4428
$C_{12}H_{11}Mo^+$	$(C_5H_7)_2(\eta\text{-CH}_2=CH_2)Mo$ (Molybdenum, bis($\eta^5\text{-2,4-cyclopentadien-1-yl})(\eta^2\text{-ethene})$ -)	37343-05-8	**	6.0 ± 0.1 (V)	PE	4425
$C_{12}H_{16}Mo^+$	$(C_5H_7)_2(CH_3)_2Mo$ (Molybdenum, bis($\eta^5\text{-2,4-cyclopentadien-1-yl}$)dimethyl-)	39333-52-3	**	6.1 ± 0.1 (V)	PE	4425

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{11}H_{16}Mo^+$	$(C_6H_5CH_3)_2Mo$ (Molybdenum, bis[(1,2,3,4,5,6- η)-methylbenzene]-)	12131-22-5	**	5.32 ± 0.05 (V)	PE	4132
$C_{18}H_{21}Mo^+$	$(C_6H_3(CH_3)_3)_2Mo$ (Molybdenum, bis[(1,2,3,4,5,6- η)-1,3,5-trimethylbenzene]-)	12131-50-9	**	5.13 ± 0.05 (V)	PE	4132
$C_8H_{21}N_1Mo^+$	$(N(CH_3)_2)_1Mo$	XXXXXX-XX-X	**	5.30 (V)	PE	5036
$C_{16}H_{10}N_1Mo^+$	$(N(C_2H_5)_2)_1Mo$	XXXXXX-XX-X	**	5.3 (V)	PE	5036
$C_{12}H_{36}N_6Mo_2^+$	$(N(CH_3)_2)_6Mo_2$	51956-20-8	**	6.74 (V)	PE	5565
$COMo^+$	$(CO)_6Mo$	13939-06-5	5CO	16.52 ± 0.03	EI	5291
	$CS(CO)_5Mo$	50358-91-3	4CO + CS	17.54 ± 0.30	EI	5291
$C_2O_2Mo^+$	$(CO)_6Mo$	13939-06-5	4CO	14.86 ± 0.02	EI	5291
	$CS(CO)_5Mo$	50358-91-3	3CO + CS	15.82 ± 0.30	EI	5291
$C_3O_3Mo^+$	$(CO)_6Mo$	13939-06-5	3CO	13.29 ± 0.02	EI	5291
	$CS(CO)_5Mo$	50358-91-3	2CO + CS	14.05 ± 0.20	EI	5291
$C_1O_4Mo^+$	$(CO)_6Mo$	13939-06-5	2CO	11.61 ± 0.02	EI	5291
	$CS(CO)_5Mo$	50358-91-3	CO + CS	12.39 ± 0.20	EI	5291
$C_3O_5Mo^+$	$(CO)_6Mo$	13939-06-5	CO	10.02 ± 0.02	EI	5291
	$CS(CO)_5Mo$	50358-91-3	CS	10.96 ± 0.20	EI	5291
$C_6O_6Mo^+$	$(CO)_6Mo$	13939-06-5	**	8.50 ± 0.02 (V)	PE	3979
			**	8.50 (V)	PE	4456
			**	8.46 ± 0.01	EI	5291
			**	8.50 ± 0.05	EI	4600
$C_{11}H_{10}OMo^+$	$(C_5H_5)_2COMo$ (Molybdenum, carbonylbis(η^5 -2,4-cyclopentadien-1-yl)-)	12701-85-8	**	5.9 ± 0.1 (V)	PE	4425
$C_{10}H_8O_3Mo^+$	$C_7H_8(CO)_3Mo$ (Molybdenum, tricarbonyl[(1,2,3,4,5,6- η)-1,3,5-cycloheptatriene]-)	12125-77-8	**	7.44 (V)	PE	5206
			**	7.46 ± 0.05 (V)	PE	4724
$C_{12}H_{12}O_3Mo^+$	$(C_6H_3(CH_3)_3)(CO)_3Mo$ (Molybdenum, tricarbonyl[(1,2,3,4,5,6- η)-1,3,5-trimethylbenzene]-)	12089-15-5	**	7.35 ± 0.05 (V)	PE	4724
			**	7.37 (V)	PE	5367
$C_{11}H_8O_1Mo^+$	$(C_7H_8)(CO)_1Mo$ (Molybdenum, [(2,3,5,6- η)-bicyclo[2.2.1]hepta-2,5-diene]tetracarbonyl-)	XXXXXX-XX-X	**	7.48 (V)	PE	5367

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_1H_1O_8Mo_2^+$	$Mo_2(O_2CH)_4$	51329-49-8	**	7.60 ± 0.05 (V)	PE	4986
			**	7.5 (V)	PE	4426
$C_8H_{12}O_8Mo_2^+$	$Mo_2(O_2CCH_3)_4$	14221-06-8	**	6.92 ± 0.05 (V)	PE	4986
			**	6.8 (V)	PE	4426
$C_{20}H_{36}O_8Mo_2^+$	$Mo_2(O_2CC(CH_3)_3)_4$	XXXXX-XX-X	**	6.75 ± 0.05 (V)	PE	4986
	$Mo_2(COOC(CH_3)_3)_4$	55946-68-4	**	6.7 (V)	PE	4426
	(Molybdenum, tetrakis[μ -(2,2-dimethylpropanoato-0:0')di-(Mo-Mo)])					
$C_{12}H_{11}N_2O_3Mo^+$	$(C_3H_4N_2(C_2H_5)_2)(CO)_5Mo$	XXXXX-XX-X	**	6.90 (V)	PE	5601
$C_2H_2N_4O_4Mo_2^+$	$(C_3H_4N(O)CH_3)_4Mo_2$	67634-80-4	**	5.89 (V)	PE	5191
	(Molybdenum, tetrakis[μ -(6-methyl-2(1H)-pyridinonato- $N^1:O^3$)]di-(Mo-Mo), stereoisomer)					
$C_{16}H_{20}N_2O_6Mo_2^+$	$C_{16}H_{20}N_2O_6Mo_2$	XXXXX-XX-X	**	6.24 ± 0.04	PE	5596
FMo^+	MoF	60388-18-3	**	8.0 ± 0.3	EI	4864
F_2Mo^+	MoF ₂	20205-60-1	**	9.00 ± 0.15	EI	4864
	MoF ₃	20193-58-2	F	14.3 ± 1.0	EI	5424
	MoF ₄	XXXXX-XX-X		19.0 ± 1.0	EI	5424
F_3Mo^+	MoF ₃	20193-58-2	**	9.88 ± 0.10	EI	4864
			**	10.2 ± 0.5	EI	5424
	MoF ₄	23412-45-5	F	14.01 ± 0.5	EI	5424
F_4Mo^+	MoF ₄	23412-45-5	**	9.74 ± 0.2	EI	5424
			**	10.11 ± 0.10	EI	4864
F_5Mo^+	MoF ₅	13819-84-6	**	10.60 ± 0.10	EI	4864
			**	10.81 ± 0.2	EI	5424
	MoF ₆	7783-77-9	F	15.2 ± 0.2	EI	4864
F_6Mo^+	MoF ₆	7783-77-9	**	14.5 ± 0.1	PE	4989
OF_3Mo^+	MoOF ₃	22529-29-9	**	11.0 ± 0.5	EI	5434
$C_8F_{12}O_8Mo_2^+$	$Mo_2(O_2CCF_3)_4$	36608-07-8	**	8.67 ± 0.05 (V)	PE	4986
$O_4Na_2Mo^+$	Na_2MoO_4	XXXXX-XX-X	**	7.2	EI	4578
$C_{13}H_{21}O_6Si_2Mo^+$	$C_{13}H_{21}O_6Si_2Mo$	XXXXX-XX-X	**	7.27 (V)	PE	5601

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_6H_{18}N_3PMo^+$	(((CH ₃) ₂ N) ₃ P)(CO) ₅ Mo	14971-43-8	5CO	10.3±0.05	EI	3952
	(((CH ₃) ₂ N) ₃ P) ₂ (CO) ₄ Mo	27342-90-1		16.1±0.05	EI	3952
$C_{12}H_{36}N_6P_2Mo^+$	(((CH ₃) ₂ N) ₃ P) ₂ (CO) ₄ Mo	27342-90-1	4CO	14.8±0.05	EI	3952
$C_8H_9O_5PMo^+$	((CH ₃) ₃ P)(CO) ₅ Mo	16917-96-7	**	7.7	PE	5602
$C_{11}H_{15}O_5PMo^+$	((C ₂ H ₅) ₃ P)(CO) ₅ Mo	19217-79-9	**	7.7	PE	5602
$C_{23}H_{15}O_5PMo^+$	(C ₆ H ₅) ₃ (CO) ₅ PMo (Molybdenum, pentacarbonyl(triphenylphosphine)-)	14971-42-7	**	7.70±0.05	EI	4600
$C_{23}H_{33}O_5PMo^+$	(C ₆ H ₁₁) ₃ P(CO) ₅ Mo (Molybdenum, pentacarbonyl (tricyclohexylphosphine)-(OC-6-22)-)	15603-94-8	**	7.44 (V)	PE	5139
$C_8H_9O_8PMo^+$	((CH ₃ O) ₃ P)(CO) ₅ Mo	15631-20-6	**	8.1	PE	5602
$C_{11}H_{15}O_8PMo^+$	((C ₂ H ₅ O) ₃ P)(CO) ₅ Mo	15603-75-5	**	8.0	PE	5602
$C_{40}H_{30}O_4P_2Mo^+$	C ₄₀ H ₃₀ O ₄ P ₂ Mo (Molybdenum, tetracarbonylbis(triphenylphosphine)-(OC-6-12)-)	16244-53-4	**	7.60±0.05	EI	4600
$C_7H_{18}N_3OPMo^+$	(((CH ₃) ₂ N) ₃ P)(CO) ₅ Mo	14971-43-8	4CO	12.1±0.05	EI	3952
$C_8H_{18}N_3O_2PMo^+$	(((CH ₃) ₂ N) ₃ P)(CO) ₅ Mo	14971-43-8	3CO	9.9±0.05	EI	3952
$C_9H_{18}N_3O_3PMo^+$	(((CH ₃) ₂ N) ₃ P)(CO) ₅ Mo	14971-43-8	2CO	9.6±0.05	EI	3952
$C_{10}H_{18}N_3O_1PMo^+$	(((CH ₃) ₂ N) ₃ P)(CO) ₅ Mo	14971-43-8	CO	7.8±0.05	EI	3952
$C_{11}H_{18}N_3O_5PMo^+$	(((CH ₃) ₂ N) ₃ P)(CO) ₅ Mo	14971-43-8	**	7.8	PE	5602
			**	5.7±0.05	EI	3952
$C_{13}H_{36}N_6OP_2Mo^+$	(((CH ₃) ₂ N) ₃ P) ₂ (CO) ₄ Mo	27342-90-1	3CO	14.0±0.05	EI	3952
$C_{11}H_{36}N_6O_2P_2Mo^+$	(((CH ₃) ₂ N) ₃ P) ₂ (CO) ₄ Mo	27342-90-1	2CO	11.2±0.05	EI	3952
$C_{15}H_{36}N_6O_3P_2Mo^+$	(((CH ₃) ₂ N) ₃ P) ₂ (CO) ₄ Mo	27342-90-1	CO	11.1±0.05	EI	3952
$C_{16}H_{36}N_6O_4P_2Mo^+$	(((CH ₃) ₂ N) ₃ P) ₂ (CO) ₄ Mo	27342-90-1	**	6.8±0.05	EI	3952
$F_{18}P_6Mo^+$	(PF ₆) ₆ Mo	15339-46-5	**	9.17 (V)	PE	4456

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_3H_9N_3F_{12}P_6Mo^+$	(CH ₃ N(PF ₂) ₂) ₃ Mo	63353-75-3	**	7.93 (V)	PE	5376
$C_5O_5F_3PMo^+$	(PF ₃)(CO) ₅ Mo	15322-05-1	** **	8.55 (V) 8.8	PE PE	5539 5602
$CSMo^+$	CS(CO) ₅ Mo	50358-91-3	5CO	16.07±0.09	EI	5291
C_2OSMo^+	CS(CO) ₅ Mo	50358-91-3	4CO	14.46±0.05	EI	5291
$C_3O_2SMo^+$	CS(CO) ₅ Mo	50358-91-3	3CO	12.39±0.09	EI	5291
$C_1O_3SMo^+$	CS(CO) ₅ Mo	50358-91-3	2CO	11.02±0.05	EI	5291
$C_5O_1SMo^+$	CS(CO) ₅ Mo	50358-91-3	CO	9.36±0.05	EI	5291
$C_6O_5SMo^+$	CS(CO) ₅ Mo	50358-91-3	**	8.18±0.02	EI	5291
$ClMo^+$	MoCl ₅	10241-05-1		20.3	EI	3783
Cl_2Mo^+	MoCl ₅	10241-05-1		17.1	EI	3783
Cl_3Mo^+	MoCl ₅	10241-05-1		12.9	EI	3783
Cl_1Mo^+	MoCl ₅	10241-05-1		10.1	EI	3783
Cl_3Mo^+	MoCl ₅	10241-05-1	** **	9.27 (V) 9.2	PE EI	4764 3783
$C_{12}H_{11}Cl_2Mo^+$	(η-CH ₃ C ₅ H ₄) ₂ MoCl ₂ (Molybdenum,dichlorobis[(1,2,3,4,5-η)-1-methyl-2,4-cyclopentadien-1-yl]-)	63374-10-7	**	6.8±0.1 (V)	PE	4987
$O_2Cl_2Mo^+$	MoO ₂ Cl ₂	XXXXX-XX-X	**	11.93±0.02	PE	5148
$C_5O_5PCl_3Mo^+$	(PCl ₃)(CO) ₅ Mo	19212-18-1	**	8.36 (V)	PE	5539
$C_8H_{12}O_8CrMo^+$	CrMo(O ₂ CCH ₃) ₄	XXXXX-XX-X	**	7.06±0.05 (V)	PE	4986
$C_{21}H_{21}N_1O_1CrMo^+$	(C ₅ H ₅ N(O)CH ₃) ₄ MoCr (Molybdenum,(chromium)tetrakis[μ-(6-methyl-2(1H)-pyridinonato-N ¹ :O ²)]-(Cr-Mo))	72070-57-6	**	6.0 (V)	PE	5191
$C_{23}H_{15}O_5AsMo^+$	(C ₆ H ₅) ₃ (CO) ₅ AsMo (Molybdenum, pentacarbonyl(triphenylarsine)-(OC-6-22)-)	19212-22-7	**	7.80±0.05	EI	4600

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{12}H_{11}Br_2Mo^+$	$(\eta-CH_3C_5H_4)_2MoBr_2$ (Molybdenum, dibromobis[(1,2,3,4,5- η)-1-methyl-2,4-cyclopentadien-1-yl]-)	63984-91-8	**	6.9 ± 0.1 (V)	PE	4987
$C_5O_5PBr_3Mo^+$	$(PBr_3)(CO)_5Mo$	22466-07-5	**	8.33 (V)	PE	5539
Ru^+	Ru	7440-18-8	**	7.16 ± 0.07	EI	5342
	$(C_5H_5)_2Ru$ (Ruthenocene)	1287-13-4	$(C_5H_5)_2$	16.50 ± 0.25	EI	3628
$C_3H_3Ru^+$	$(C_5H_5)_2Ru$ (Ruthenocene)	1287-13-4		19.6 ± 0.2	EI	3628
$C_5H_5Ru^+$	$(C_5H_5)_2Ru$ (Ruthenocene)	1287-13-4	C_5H_5	14.75 ± 0.25	EI	3628
$C_8H_8Ru^+$	$(C_5H_5)_2Ru$ (Ruthenocene)	1287-13-4	C_2H_2	14.6 ± 0.2	EI	3628
$C_{10}H_{10}Ru^+$	$(C_5H_5)_2Ru$ (Ruthenocene)	1287-13-4	**	7.45 (V)	PE	3688
			**	7.45 (V)	PE	5394
			**	7.50 ± 0.25	EI	3628
$C_{12}H_{11}Ru^+$	$(C_5H_4CH_3)_2Ru$ (Ruthenocene, 1,1'-dimethyl-)	33292-37-4	**	7.25 (V)	PE	3688
O_1Ru^+	RuO_4	20427-56-9	**	12.09	PE	3836
			**	12.15	PE	4166
			**	12.15 ± 0.02 (V)	PE	5148
			**	12.16	PE	3838
$C_{12}O_{12}Ru_3^+$	$(CO)_{12}Ru_3$ (Ruthenium, dodecacarbonyltri-)	15243-33-1	**	7.7 ± 0.2 (V)	PE	4882
			**	7.91 (V)	PE	5189
$C_9H_8O_3Ru^+$	$(C_6H_8)(CO)_3Ru$ (Ruthenium, tricarbonyl[(1,2,3,4- η)-1,3-cyclohexadiene]-)	12108-25-7	**	8.01 (V)	PE	5551
$C_{10}H_{10}O_3Ru^+$	$(C_7H_{10})(CO)_3Ru$ (Ruthenium, tricarbonyl[(1,2,3,4- η)-1,3-cycloheptadiene]-)	41550-67-8	**	7.96 (V)	PE	5551
$C_{15}H_3O_6F_{18}Ru^+$	$(CF_3COCHCOCF_3)_3Ru$ (Ruthenium, tris(1,1,1,5,5,5-hexafluoropentanedionato- <i>O,O'</i>)-, (<i>OC</i> -6-11)-)	16827-63-7	**	8.85 ± 0.07 (V)	PE	3682
$F_{15}P_3Ru^+$	$Ru(CO)_5$	19702-30-8	**	9.17 (V)	PE	4456
Rh^+	Rh	7440-16-6	**	7.1 ± 0.6	EI	4909

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
Rh^+	Rh	7440-16-6	**	7.42 ± 0.08	EI	5342
Rh_2^+	Rh_2	12596-98-4	**	7.1 ± 1.0	EI	4206
CRh^+	RhC	12127-42-3	**	7.2 ± 0.5	EI	4909
			**	9.2 ± 1.0	EI	5349
			**	8.1 ± 0.6	EI	3978
			**	8.6 ± 0.4	EI	4206
			**	8.6 ± 0.4	EI	5635
C_2Rh^+	RhC_2	37306-47-1	**	8.1 ± 0.4	EI	5635
$\text{C}_7\text{H}_7\text{O}_1\text{Rh}^+$	(CH ₃ COCHCOCH ₃)Rh(CO) ₂ (Dicarbonyl(2,4-pentanedionato)rhodium)	14874-82-9	**	8.6 ± 0.1	EI	3497
$\text{C}_{12}\text{H}_6\text{O}_1\text{Rh}^+$	(CH ₃ COCHCOC ₆ H ₅)Rh(CO) ₂ (Dicarbonyl(1-phenyl-1,3-butanedionato)rhodium)	24151-55-1	**	8.4 ± 0.1	EI	3497
$\text{C}_{17}\text{H}_{11}\text{O}_1\text{Rh}^+$	(C ₆ H ₅ COCHCOC ₆ H ₅)Rh(CO) ₂ (Dicarbonyl(1,3-diphenyl-1,3-propanedionato)rhodium)	24151-56-2	**	8.4 ± 0.1	EI	3497
$\text{C}_{15}\text{H}_{21}\text{O}_6\text{Rh}^+$	(CH ₃ COCHCOCH ₃) ₃ Rh (Tris(2,4-pentanedionato)rhodium)	14284-92-5	**	7.34 ± 0.01	EI	3496
			**	7.75 ± 0.05	EI	3497
$\text{C}_{15}\text{H}_{20}\text{NO}_8\text{Rh}^+$	((CH ₃ CO) ₂ CH) ₂ Rh(NO ₂ C(OCCH ₃) ₂) (OC-6-22-(3-Nitro-2,4-pentanedionato-O ² ,O ¹)bis(2,4-pentanedionato-O,O')rhodium)	36530-11-7	**	7.65 ± 0.02	EI	3496
$\text{C}_{15}\text{H}_{19}\text{N}_2\text{O}_{10}\text{Rh}^+$	((CH ₃ CO) ₂ CNO ₂) ₂ Rh(CH(OCCH ₃) ₂) (OC-6-21-Bis(3-nitro-2,4-pentanedionato-O ² ,O ¹)(2,4-pentanedionato-O,O')rhodium)	36530-12-8	**	7.97 ± 0.03	EI	3496
$\text{C}_{15}\text{H}_{18}\text{N}_3\text{O}_{12}\text{Rh}^+$	(CH ₃ CO(NO ₂)COCH ₃) ₃ Rh (OC-6-11-Tris(3-nitro-2,4-pentanedionato-O ² ,O ¹)rhodium)	36530-13-9	**	8.39 ± 0.04	EI	3496
$\text{C}_{21}\text{H}_{36}\text{N}_1\text{O}_1\text{Rh}_2^+$	(C ₅ H ₇ N(CH ₃)OH) ₃ Rh ₂ (Rhenium,tetrakis(6-methyl-2-pyridinol)-)	XXXXX-XX-X	**	6.49 ± 0.02	PE	5579
$\text{C}_7\text{H}_1\text{O}_1\text{F}_3\text{Rh}^+$	(CH ₃ COCHCOCF ₃)Rh(CO) ₂ (Dicarbonyl(1,1,1-trifluoro-2,4-pentanedionato)rhodium)	18517-13-0	**	8.85 ± 0.05	EI	3497
$\text{C}_7\text{HO}_1\text{F}_6\text{Rh}^+$	(CF ₃ COCHCOCF ₃)Rh(CO) ₂ (Dicarbonyl(1,1,1,5,5,5-hexafluoro-2,4-pentanedionato)rhodium)	18517-12-9	**	9.2 ± 0.1	EI	3497
P_2Rh^+	RhP_2	11092-25-4	**	7.7 ± 1.0	EI	4532
$\text{HF}_{12}\text{P}_1\text{Rh}^+$	$\text{H}(\text{PF}_6)_3\text{Rh}$	16842-03-8	**	9.70 (V)	PE	4456

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$\text{HF}_{12}\text{P}_1\text{Rh}^+$	$(\text{PF}_3)_1\text{RhH}$	16949-48-7	**	9.7	PE	4021
$\text{C}_{12}\text{H}_{30}\text{O}_6\text{P}_3\text{S}_6\text{Rh}^+$	$((\text{C}_2\text{H}_5)_2\text{S}_2\text{PO}_2)_3\text{Rh}$	33991-54-7	**	7.70 (V)	PE	5203
$\text{C}_1\text{O}_1\text{Cl}_2\text{Rh}_2^+$	$((\text{CO})_1\text{RhCl})_2$	14404-25-2	**	8.89 ± 0.03 (V)	PE	5255
	$(\text{CO})_1\text{Rh}_2\text{Cl}_2$	14523-22-9		9.01 (V)	PE	5327
$\text{F}_{12}\text{P}_1\text{Cl}_2\text{Rh}_2^+$	$(\text{PF}_3)_1\text{Rh}_2\text{Cl}_2$	14876-98-3		9.0 (V)	PE	5327
ScRh^+	RhSc	12166-12-0	**	8.0 ± 1.0	EI	5349
TiRh^+	RhTi	12600-90-7	**	8.2 ± 1.0	EI	4206
Ti_2Rh^+	RhTi_2	12067-05-9	**	7.9 ± 1.0	EI	4206
YRh^+	RhY	XXXXX-XX-X	**	7.2 ± 1.0	EI	5349
Pd^+	Pd	7440-05-3	**	8.0 ± 0.4	EI	3597
			**	8.35 ± 0.05	EI	5342
$\text{C}_6\text{H}_{16}\text{Pd}^+$	$(\text{C}_3\text{H}_5)_2\text{Pd}$	12240-87-8	**	7.56 (V)	PE	5281
			**	7.24 ± 0.03	PE	3711
$\text{C}_8\text{H}_{11}\text{Pd}^+$	$(\text{CH}_2\text{C}(\text{CH}_3)\text{CH}_2)_2\text{Pd}$	41348-25-8	**	7.33 (V)	PE	5281
$\text{C}_{36}\text{H}_{11}\text{N}_1\text{Pd}^+$	$((\text{C}_2\text{H}_5)_2\text{C}_1\text{NCH})_1\text{Pd}$	24804-00-0	**	6.37 ± 0.03 (V)	PE	5476
	$(\text{Palladium}, [2,3,7,8,12,13,17,18\text{-octaethyl-21H,23H-porphinato}(2\text{-})\text{-N}^{21},\text{N}^{22},\text{N}^{23},\text{N}^{24}]\text{-}(\text{SP-4-1})\text{-})$					
$\text{C}_{10}\text{H}_{16}\text{O}_1\text{Pd}^+$	$((\text{CH}_3\text{CO})_2\text{CH}_2)_2\text{Pd}$	XXXXX-XX-X	**	7.79 (V)	PE	5568
$\text{C}_{22}\text{H}_{10}\text{O}_1\text{Pd}^+$	$((\text{CH}_3)_1\text{CCO})_2\text{CH}_2)_2\text{Pd}$	XXXXX-XX-X	**	7.67 (V)	PE	5568
$\text{C}_{12}\text{H}_{18}\text{N}_2\text{O}_2\text{Pd}^+$	$\text{C}_{12}\text{H}_{18}\text{O}_2\text{N}_2\text{Pd}$	38337-62-1	**	6.88 (V)	PE	3822
	$(\text{Palladium}, [[4,4'\text{-(1,2-ethanediyldinitrilo)bis[2-pentanonato]](2^-)-N,N',O,O'}\text{-(SP-4-2)}\text{-})$					
$\text{F}_{12}\text{P}_1\text{Pd}^+$	$\text{Pd}(\text{PF}_3)_1$	13815-33-3	**	9.9 ± 0.1 (V)	PE	4187
$\text{C}_{12}\text{H}_{18}\text{N}_2\text{S}_2\text{Pd}^+$	$(\text{CH}_3\text{C}(=\text{S})\text{CH}_2\text{C}(\text{CH}_3)\text{NCH})_2\text{Pd}$	41391-03-1	**	6.70 (V)	PE	5446
$\text{C}_8\text{H}_{20}\text{O}_1\text{P}_2\text{S}_1\text{Pd}^+$	$\text{Pd}(\text{S}_2\text{P}(\text{OC}_2\text{H}_5)_2)_2$	21312-72-1	**	7.90 ± 0.05	PE	4636
Ag^+ ($^2\text{p}^0$)	Ag	7440-22-4	**	7.576	S	5494

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
Ag^+ ($^1\text{S}_0$) ($^3\text{D}_3$) ($^3\text{D}_2$) ($^3\text{D}_1$) ($^1\text{D}_2$)	Ag	7440-22-4	**	7.57	PE	4858
			**	12.43	PE	4858
			**	12.62	PE	4858
			**	12.80	PE	4858
			**	13.28	PE	4858
			**	7.5±0.3	EI	4865
			**	7.51±0.07	EI	3574
			**	7.6	EI	3472
			**	7.62±0.07	EI	5342
			**	7.8±0.2	EI	3609
	AgCl	7783-90-6		11.1±0.3	EI	3622
	Ag_3Cl_3	12444-97-2		14.5	EI	3622
Ag_2^+	Ag_2	12187-06-3	**	6.4±0.7	EI	3440
			**	7.35±0.05	EI	3574
			**	7.4±0.8	EI	3597
			**	8.0±1.0	EI	3609
				18.0±0.5	EI	3622
	Ag_3Cl_3	12444-97-2				
	Ag_3Cl_3	12444-97-2				
	Ag_3Cl_3	12444-97-2				
	Ag_3Cl_3	12444-97-2				
	Ag_3Cl_3	12444-97-2				
	Ag_3Cl_3	12444-97-2				
	Ag_3Cl_3	12444-97-2				
Ag_3^+	Ag_3Cl_3	12444-97-2		18.4±0.5	EI	3605
FAg^+	AgF	7775-41-9	**	11.0±0.3	EI	4865
NaAg^+	NaAg	38782-42-2	**	7.0±1.5	EI	4919
AlAg^+	AgAl	12379-67-8	**	7.8±0.5	EI	3796
O_2PAg^+	AgPO_2	XXXXXX-XX-X	**	9.3	EI	4098
ClAg^+ ($^2\Pi_{3/2}$) ($^2\Pi_{1/2}$) ($^2\Sigma_{1/2}$) ($^2\Sigma^+$) ($\text{E}_{5/2}$) ($\text{E}_{3/2}$) ($\text{E}_{1/2}$) ($\text{E}_{1/2}$) ($\text{E}_{1/2}$) ($\text{E}_{1/2}$) ($\text{E}_{1/2}$)	AgCl	7783-90-6	**	10.08 (V)	PE	5297
			**	10.14 (V)	PE	5297
			**	10.62 (V)	PE	5297
			**	11.03±0.1 (V)	PE	4778
			**	13.50 (V)	PE	5297
			**	13.68 (V)	PE	5297
			**	13.80 (V)	PE	5297
			**	14.15 (V)	PE	5297
			**	14.26 (V)	PE	5297
			**	10.8±0.4	EI	3622
			**	11.3±0.5	EI	3605
			**	14.2	EI	3622
	Ag_3Cl_3	12444-97-2				
ClAg_2^+	Ag_3Cl_3	12444-97-2		12.9	EI	3622
Cl_2Ag_2^+	Ag_2Cl_2	XXXXXX-XX-X	**	10.3±0.5	EI	3605
ClAg_3^+	Ag_3Cl_3	12444-97-2		14.9±0.5	EI	3605
Cl_2Ag_3^+	Ag_3Cl_3	12444-97-2		11.1±0.3	EI	3622

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
Cl_2Ag_3^+	Ag_3Cl_3	12444-97-2		11.1 ± 0.5	EI	3605
Cl_3Ag_3^+	Ag_3Cl_3	12444-97-2	**	11.44 ± 0.04 (V)	PE	5297
			**	10.0 ± 0.5	EI	3605
			**	10.4 ± 0.3	EI	3622
			**	10.4 ± 0.3	EI	5330
	$(\text{AgCl})_3$	67244-69-3	**	10.14 ± 0.02 (V)	PE	4839
Cl_3Ag_1^+	Ag_1Cl_4	XXXXXX-XX-X		10.9 ± 0.5	EI	3605
Cl_1Ag_1^+	Ag_1Cl_4	XXXXXX-XX-X	**	9.6 ± 1.0	EI	3605
$\text{Cl}_2\text{Cu}_2\text{Ag}^+$	AgCu_2Cl_3	XXXXXX-XX-X	Cl	12.0 ± 0.4	EI	5330
$\text{Cl}_3\text{Cu}_2\text{Ag}^+$	AgCu_2Cl_3	XXXXXX-XX-X	**	10.3 ± 0.3	EI	5330
$\text{Cl}_2\text{CuAg}_2^+$	Ag_2CuCl_3	XXXXXX-XX-X	Cl	11.4 ± 0.3	EI	5330
$\text{Cl}_3\text{CuAg}_2^+$	Ag_2CuCl_3	XXXXXX-XX-X	**	10.1 ± 0.3	EI	5330
BrAg^+	AgBr	7785-23-1	**	9.59 (V)	PE	5297
			**	9.85 (V)	PE	5297
			**	10.47 (V)	PE	5297
			**	11.15 ± 0.1 (V)	PE	4778
			**	13.27 (V)	PE	5297
			**	13.39 (V)	PE	5297
			**	13.485 (V)	PE	5297
			**	13.98 (V)	PE	5297
			**	14.15 (V)	PE	5297
			**	9.1 ± 0.1	EI	4313
			**	9.5 ± 0.3	EI	3467
BrAg_2^+	Ag_3Br_3	11078-33-4		11.9 ± 0.6	EI	4313
Br_2Ag_3^+	Ag_3Br_2	11078-32-3	**	10.0 ± 0.2	EI	3467
	Ag_3Br_3	11078-33-4	Br	9.8 ± 0.2	EI	4313
Br_3Ag_3^+	Ag_3Br_3	11078-33-4	**	9.60 (V)	PE	4981
			**	11.46 ± 0.04 (V)	PE	5297
			**	9.6 ± 0.3	EI	5330
			**	9.6 ± 0.3	EI	4313
			**	9.8 ± 0.2	EI	3467
$\text{Cl}_2\text{BrAg}_3^+$	$\text{Ag}_3\text{Cl}_2\text{Br}$	XXXXXX-XX-X	**	10.35 ± 0.2	EI	5330
$\text{ClBr}_2\text{Ag}_3^+$	AgClBr_2	XXXXXX-XX-X	**	9.8 ± 0.3	EI	5330

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
Cd⁺						
	Cd	7440-43-9	**	8.993	S	5450
(² S _{1/2})			**	8.99	PEN	3537
(² P _{1/2})			**	14.5	PEN	3537
(² P _{3/2})			**	14.9	PEN	3537
(² D _{3/2})			**	17.6	PEN	3537
(² D _{5/2})			**	18.4	PEN	3537
(² D _{5/2})			**	20.2	PEN	3537
			**	9.07±0.07	EI	3745
C₂H₆Cd⁺						
	(CH ₃) ₂ Cd	506-82-1	**	8.8 (V)	PE	5300
			**	17.349 (V)	PE	4822
C₁H₁₀Cd⁺						
	(C ₂ H ₅) ₂ Cd	592-02-9	**	8.2 (V)	PE	5300
C₆H₁₁Cd⁺						
	(n-C ₃ H ₇) ₂ Cd	5905-48-6	**	8.2 (V)	PE	5300
F₂Cd⁺						
	CdF ₂	7790-79-6	**	13.18±0.04	PE	5433
C₈H₂₂Si₂Cd⁺						
	((CH ₃) ₃ SiCH ₂) ₂ Cd	XXXXX-XX-X	**	8.8 (V)	PE	5300
Cl₂Cd⁺						
(² Π _g)	CdCl ₂	10108-64-2	**	11.3 (V)	PE	3963
(² Π _{3/2g})			**	11.42 (V)	PE	4232
(² Π _{1/2g})			**	11.42 (V)	PE	4232
(² Π _u)			**	11.44±0.05 (V)	PE	3833
(² Π _u)			**	11.8 (V)	PE	3963
(² Π _{1/2u})			**	11.92 (V)	PE	4232
(² Π _{3/2u})			**	11.92 (V)	PE	4232
(² Π _u)			**	11.93±0.05 (V)	PE	3833
(² Σ _u)			**	12.4 (V)	PE	3963
(² Σ _u)			**	12.46 (V)	PE	4232
(² Σ _u)			**	12.53±0.05 (V)	PE	3833
(² Σ _g)			**	13.1 (V)	PE	3963
(² Σ _g)			**	13.12±0.05 (V)	PE	3833
(² Σ _g)			**	13.29 (V)	PE	4232
(² D _{5/2})			**	19.55 (V)	PE	4232
(² D _{5/2})			**	20.27 (V)	PE	4232
Br₂Cd⁺						
(² Π _{3/2g})	CdBr ₂	7789-42-6	**	10.3 (V)	PE	3963
(² Π _{3/2g})			**	10.58±0.05 (V)	PE	3833
(² Π _{3/2g})			**	10.59 (V)	PE	4232
(² Π _{3/2u})			**	10.6 (V)	PE	3963
(² Π _{1/2g})			**	10.7 (V)	PE	3963
(² Π _{1/2u})			**	10.8 (V)	PE	3963
(² Π _{1/2g})			**	10.94±0.05 (V)	PE	3833
(² Π _{1/2g})			**	10.965 (V)	PE	4232
(² Π _u)			**	11.15±0.05 (V)	PE	3833
(² Π _{1/2u})			**	11.31 (V)	PE	4232
(² Σ _u)			**	11.7 (V)	PE	3963
(² Σ _u)			**	11.85±0.05 (V)	PE	3833
(² Σ _u)			**	11.85 (V)	PE	4232
(² Σ _g)			**	12.4 (V)	PE	3963
(² Σ _g)			**	12.78±0.05 (V)	PE	3833
(² Σ _g)			**	12.84 (V)	PE	4232
(² D _{5/2})			**	19.31 (V)	PE	4232

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
Br₂Cd⁺ (² D _{3/2}) CdBr ₂		7789-42-6	**	19.95 (V)	PE	4232
In⁺						
(S ₀)	In	7440-74-6	**	5.78±0.03	PE	5052
(P ₀)			**	11.01±0.06	PE	5052
(P ₁)			**	11.15±0.04	PE	5052
(P ₁)			**	13.56±0.05	PE	5052
(P ₂)			**	24.27±0.03	PE	5052
(F ₂)			**	24.88±0.04	PE	5052
(P ₀)			**	24.96±0.04	PE	5052
(D ₃)			**	25.06±0.03	PE	5052
(P ₁)			**	25.32	PE	5052
(D ₁)			**	25.91±0.04	PE	5052
			**	5.85±0.07	EI	3745
	InBO ₂	XXXXX-XX-X	BO ₂	10.65±0.11	EI	5587
C₅H₅In⁺						
	C ₅ H ₅ In	34822-89-4	**	8.28 (V)	PE	4777
	(Indium, (η ⁵ -2,4-cyclopentadien-1-yl)-)		**	8.3±0.1 (V)	PE	4853
OIn₂⁺						
	In ₂ O	12030-22-7	**	8.3±0.3	EI	3491
BO₂In⁺						
	InBO ₂	XXXXX-XX-X	**	9.65±0.08	EI	5587
C₁₂H₃₀O₆P₃S₆In⁺						
	((C ₂ H ₅) ₂ S ₂ PO ₂) ₃ In	21602-84-6	**	8.3 (V)	PE	5203
ClIn⁺						
(Σ)	InCl	13465-10-6	**	9.51	PE	3640
(Σ _{1/2})			**	9.71 (V)	PE	4713
(Π)			**	10.17	PE	3640
(Π _{3/2} +Π _{1/2})			**	10.85 (V)	PE	4713
(Σ)			**	12.82	PE	3640
(Σ _{1/2})			**	13.11 (V)	PE	4713
(D _{5/2})			**	25.30 (V)	PE	5035
(D _{5/2})			**	25.31 (V)	PE	4713
(D _{5/2})			**	25.46 (V)	PE	4713
(D _{3/2})			**	26.20 (V)	PE	5035
(D _{3/2})			**	26.24 (V)	PE	4713
(D _{3/2})			**	26.46 (V)	PE	4713
Cl₃In⁺						
	InCl ₃	10025-82-8	**	~ 11.4 (V)	PE	4398
			**	11.45	PE	4215
BrIn⁺						
(Π)	InBr	14280-53-6	**	6.62	PE	3640
(Σ)			**	9.09	PE	3640
(Σ _{1/2})			**	9.35 (V)	PE	4713
(Π _{3/2})			**	9.90 (V)	PE	4713
(Π _{1/2})			**	10.13 (V)	PE	4713
(Σ)			**	12.38	PE	3640
(Σ _{1/2})			**	12.78 (V)	PE	4713
(D _{5/2})			**	25.19 (V)	PE	4713
(D _{5/2})			**	25.26 (V)	PE	5035
(D _{5/2})			**	25.30 (V)	PE	4713
(D _{3/2})			**	26.07 (V)	PE	4713
(D _{3/2})			**	26.14 (V)	PE	5035

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
BrIn⁺ (² D _{3/2}) (² Σ _{1/2})	InBr	14280-53-6	**	26.18 (V)	PE	4713
			**	26.40 (V)	PE	4713
Br₃In⁺	InBr ₃	13465-09-3	**	10.3 (V)?	PE	4398
			**	10.32	PE	4215
Sn⁺ (² P _{1/2}) (² P _{3/2})	Sn	7440-31-5	**	7.344	S	5496
			**	7.871	S	5496
			**	7.28±0.07	EI	3745
H₁Sn⁺	SnH ₄	2406-52-2	**	10.75	PE	3716
C₃H₉Sn⁺	(CH ₃) ₃ Sn	594-27-4	CH ₃	9.58±0.19	EI	3548
	<i>tert</i> -C ₄ H ₉ (CH ₃) ₂ Sn	3531-47-3	(CH ₃) ₃ C	9.32±0.16	EI	3548
	((CH ₃) ₂ Sn) ₂	661-69-8	(CH ₃) ₃ Sn	9.51±0.22	EI	3548
	((CH ₃) ₂ Si)(CH ₃) ₂ Sn	16393-88-7	(CH ₃) ₃ Si	9.80±0.24	EI	3548
	C ₆ H ₇ SSn(CH ₃) ₃	1007-27-8		9.42±0.1	EI	4198
	(Stannane, trimethyl(phenylthio)-)					
	C ₇ H ₅ (CO) ₃ CrSn(CH ₃) ₃	31854-87-2		9.09±0.1	EI	3495
	(Tricarbonyl(η ⁵ -2,4-cyclopentadien-1-yl)(trimethylstannyl)chromium)					
	((CH ₃) ₂ Sn)(CO) ₃ Mn	14126-94-4		8.85±0.13	EI	5321
	((CH ₃) ₂ Sn)(CO) ₃ Co	13964-90-4		9.06±0.15	EI	5321
	((CH ₃) ₂ Ge)(CH ₃) ₂ Sn	16393-89-8	(CH ₃) ₃ Ge	9.85±0.22	EI	3548
	(C ₅ H ₅) ₂ (Sn(CH ₃) ₃)MoH	51159-64-9		9.19±0.15	EI	5321
	(Molybdenum, bis(η ⁵ -2,4-cyclopentadien-1-yl)hydro(trimethylstannyl)-)					
	C ₇ H ₅ (CO) ₃ MoSn(CH ₃) ₃	12214-92-5		9.85±0.1	EI	3495
	(Tricarbonyl(η ⁵ -2,4-cyclopentadien-1-yl)(trimethylstannyl)molybdenum)					
	C ₁₇ H ₂₆ O ₂ SnMo	51231-85-7		9.44±0.13	EI	5321
	(Molybdenum, bis(η ⁵ -2,4-cyclopentadien-1-yl)[3-methoxy-1-(methoxycarbonyl)-3-oxo-1-propenyl](trimethylstannyl)-)					
	(C ₅ H ₅) ₂ (Sn(CH ₃) ₃)MoCl	51231-83-5		9.30±0.14	EI	5321
	(Molybdenum, chlorobis(η ⁵ -2,4-cyclopentadien-1-yl)(trimethylstannyl)-)					
	(C ₅ H ₅) ₂ (Sn(CH ₃) ₃)MoBr	51231-84-6		9.36±0.12	EI	5321
	(Molybdenum, bromobis(η ⁵ -2,4-cyclopentadien-1-yl)(trimethylstannyl)-)					
	(C ₅ H ₅) ₂ (Sn(CH ₃) ₃)MoI	51249-26-4		9.42±0.15	EI	5321
	(Molybdenum, bis(η ⁵ -2,4-cyclopentadien-1-yl)iodo(trimethylstannyl)-)					
	(C ₅ H ₅) ₂ (Sn(CH ₃) ₃)TaH ₂	51192-04-2		9.46±0.11	EI	5321
	(Tantalum, bis(η ⁵ -2,4-cyclopentadien-1-yl)dihydro(trimethylstannyl)-)					
	(C ₅ H ₅) ₂ (Sn(CH ₃) ₃)WH	51192-18-8		9.73±0.12	EI	5321
	(Tungsten, bis(η ⁵ -2,4-cyclopentadien-1-yl)hydro(trimethylstannyl)-)					
	C ₇ H ₅ (CO) ₃ WSn(CH ₃) ₃	12093-29-7		10.05±0.15	EI	3495
	(Tricarbonyl(η ⁵ -2,4-cyclopentadien-1-yl)(trimethylstannyl)tungsten)					
	((CH ₃) ₂ Sn)(CO) ₃ Re	15219-90-6		9.59±0.13	EI	5321
C₃H₁₀Sn⁺	(CH ₃) ₃ SnH	1631-73-8	**	9.9 (V)	PE	4985
C₄H₇Sn⁺	(CH ₃) ₂ SnC≡CH	1112-00-1	CH ₃	9.84±0.08	EI	4126
C₄H₁₂Sn⁺	(CH ₃) ₃ Sn	594-27-4	**	8.85±0.1	PE	3677
			**	8.93±0.04	PE	3880
			**	9.7 (V)	PE	5571
			**	9.75 (V)	PE	4457
			**	9.75 (V)	PE	4241
			**	8.76±0.12	EI	3548

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_5H_{12}Sn^+$	$CH_2=CHSn(CH_3)_3$	754-06-3	**	9.7 (V)	PE	4457
$C_5H_{11}Sn^+$	$C_2H_7Sn(CH_3)_3$	3531-44-0	** **	9.1 (V) 9.1 (V)	PE PE	4457 5571
$C_6H_{11}Sn^+$	$CH_2=CHCH_2Sn(CH_3)_3$	762-73-2	** **	8.50 (V) 8.70 (V)	PE PE	4172 4241
$C_6H_{16}Sn^+$	$(C_2H_5)_3SnH$ $(CH_3)_3(n-C_3H_7)Sn$	997-50-2 3531-45-1	** ** **	9.1 (V) 9.1 (V) 8.9 (V)	PE PE PE	4985 5571 4457
	$(CH_3)_2(C_2H_5)_2Sn$ <i>iso</i> - $C_3H_7Sn(CH_3)_3$	4282-05-7 3531-46-2	** ** **	9.01 (V) 8.77 (V) 8.9 (V)	PE PE PE	5571 4457 5571
$C_7H_{16}Sn^+$	$(CH_3)_3SnCH_2CH_2CH=CH_2$ $C_3H_7CH_2Sn(CH_3)_3$ (Stannane, (cyclopropylmethyl)trimethyl-)	17314-38-4 51675-53-7	** **	9.71 (V) 8.85 (V)	PE PE	4241 4241
$C_7H_{18}Sn^+$	$(CH_3)_3(C_1H_9)Sn$ $(C_2H_5)_3(CH_3)Sn$ $(CH_3)_3(iso-C_4H_9)Sn$ $(CH_3)_3(tert-C_4H_9)Sn$	1527-99-7 2097-60-1 1118-10-1 3531-47-3	** ** ** ** ** ** **	9.0 (V) 9.52 (V) 8.95 (V) 9.05 (V) 9.33 (V) 8.50 (V) 8.65 (V) 8.34±0.11	PE PE PE PE PE PE PE EI	5571 4241 5571 5571 4241 5571 4457 3548
$C_8H_{18}Sn^+$	$(CH_3)_3Sn(CH_2)_3CH=CH_2$ $C_5H_9Sn(CH_3)_3$ (Stannane, cyclopentyltrimethyl-)	34232-11-6 15095-84-8	** **	9.72 (V) 8.72 (V)	PE PE	4241 4457
$C_8H_{20}Sn^+$	$(C_2H_5)_3Sn$ $(CH_3)_2(C_3H_7)_2Sn$ $(CH_3)_2(iso-C_3H_7)_2Sn$	597-64-8 56535-52-5 XXXXX-XX-X	** ** ** ** **	8.87 (V) 8.93 (V) 9.0 (V) 8.8 (V) 8.56 (V)	PE PE PE PE PE	4457 5571 4985 5571 5571
$C_9H_{11}Sn^+$	$C_6H_5(CH_3)_3Sn$ (Stannane, trimethylphenyl-)	934-56-5	** ** **	8.83±0.05 8.94 (V) ~8.75	PE PE CTS	4589 4280 3922
$C_9H_{20}Sn^+$	$C_6H_{11}Sn(CH_3)_3$ (Stannane, cyclohexyltrimethyl-)	3531-48-4	**	8.57 (V)	PE	4457
$C_9H_{22}Sn^+$	<i>iso</i> - $C_7H_{15}SnH$	759-23-9	**	8.6 (V)	PE	4985
$C_{10}H_{10}Sn^+$	$(C_5H_5)_2Sn$ (Stannocene)	1294-75-3	**	7.75±0.05 (V)	PE	4853

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₁₀H₁₆Sn⁺	C ₆ H ₅ CH ₂ (CH ₃) ₃ Sn (Stannane, trimethyl(phenylmethyl)-)	4314-94-7	**	8.08±0.05	PE	4589
	C ₆ H ₅ CH ₂ (CH ₃) ₃ Sn (Stannane, trimethyl(phenylmethyl)-)	4314-94-7	**	8.1 (V)	PE	4172
			**	8.21 (V)	PE	4280
			**	7.91	CTS	3922
C₁₀H₁₈Sn⁺	C ₇ H ₉ Sn(CH ₃) ₃ (Stannane, bicyclo[2.2.1]hept-2-en-2-yltrimethyl-)	38573-92-1	**	8.45 (V)	PE	4457
C₁₀H₂₁Sn⁺	(CH ₃) ₂ (C ₁ H ₉) ₂ Sn	1528-00-3	**	8.8 (V)	PE	5571
	(CH ₃) ₂ (<i>tert</i> -C ₄ H ₉) ₂ Sn	35569-11-0	**	8.22 (V)	PE	5571
C₁₂H₁₆Sn⁺	(C ₉ H ₇)(CH ₃) ₃ Sn (Stannane, 1 <i>H</i> -inden-1-yltrimethyl-)	23022-40-4	**	7.29±0.01	EI	3805
C₁₂H₁₈Sn⁺	(C ₉ H ₉)(CH ₃) ₃ Sn (Stannane, (2,3-dihydro-1 <i>H</i> -inden-1-yl)trimethyl-)	41273-55-6	**	7.29±0.01	EI	3805
C₁₂H₂₈Sn⁺	(C ₃ H ₇) ₃ Sn	2176-98-9	**	8.82 (V)	PE	5571
	(n-C ₄ H ₉) ₃ SnH	688-73-3	**	8.8 (V)	PE	4985
	(iso-C ₃ H ₇) ₃ Sn	2949-42-0	**	8.46 (V)	PE	5571
C₁₃H₁₆Sn⁺	C ₁₀ H ₇ Sn(CH ₃) ₃ (Stannane, trimethyl-1-naphthalenyl-)	944-85-4	**	7.99	CTS	3922
C₁₃H₂₂Sn⁺	C ₆ H ₅ CH ₂ Sn(C ₂ H ₅) ₃ (Stannane, triethyl(phenylmethyl)-)	18629-74-8	**	7.9 (V)	PE	4172
C₁₁H₁₃Sn⁺	C ₁₃ H ₁₀ Sn(CH ₃) ₂ (Dibenzo[<i>b,e</i>]stannin, 5,10-dihydro-5,5-dimethyl-)	23708-66-9	CH ₃	9.0	EI	4228
C₁₁H₁₈Sn⁺	C ₁₀ H ₇ CH ₂ (CH ₃) ₃ Sn (Stannane, trimethyl(1-naphthalenylmethyl)-)	51220-36-1	**	~7.6	CTS	3922
C₁₁H₃₀Sn⁺	(CH ₂ =CH)(n-C ₄ H ₉) ₃ Sn	7486-35-3	**	8.6 (V)	PE	3850
C₁₅H₁₆Sn⁺	C ₁₃ H ₁₀ Sn(CH ₃) ₂ (Dibenzo[<i>b,e</i>]stannin, 5,10-dihydro-5,5-dimethyl-)	23708-66-9	**	≤8.6	EI	4228
C₁₅H₃₂Sn⁺	(CH ₂ =CHCH ₂)(n-C ₄ H ₉) ₃ Sn	24850-33-7	**	8.4 (V)	PE	3850
C₁₆H₃₆Sn⁺	(C ₁ H ₉) ₃ Sn	1461-25-2	**	8.76 (V)	PE	5571
			**	8.7 (V)	PE	3850
	(sec-C ₄ H ₉) ₃ Sn	6031-41-0	**	8.45 (V)	PE	5571
	(iso-C ₄ H ₉) ₃ Sn	3531-43-9	**	8.68 (V)	PE	5571

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{18}H_{15}Sn^+$	$((C_6H_5)_3Sn)(CO)_5Mn$ (Manganese, pentacarbonyl(triphenylstannyl)-(OC-6-22)-)	14405-84-6		8.38 ± 0.15	EI	5321
	$(C_6H_5)_3SnFe(CO)_2C_5H_5$ (Iron, dicarbonyl(η^5 -2,4-cyclopentadien-1-yl)(triphenylstannyl)-)	12132-09-1		9.00 ± 0.24	EI	4204
	$((C_6H_5)_3Sn)(CO)_5Re$ (Rhenium, pentacarbonyl(triphenylstannyl)-(OC-6-22)-)	15614-21-8		9.16 ± 0.21	EI	4204
	$((C_6H_5)_3Sn)(CO)_5Re$ (Rhenium, pentacarbonyl(triphenylstannyl)-(OC-6-22)-)	15614-21-8		9.16 ± 0.11	EI	5321
$C_{18}H_{16}Sn^+$	$(C_6H_5)_3SnH$ (Stannane, triphenyl-)	892-20-6	**	9.11 ± 0.05 (V)	PE	4620
	$C_6H_5CH_2Sn(C_6H_5)_3$ (Stannane, tributyl(phenylmethyl)-)	28493-54-1	**	7.9 (V)	PE	4172
$C_{20}H_{11}Sn^+$	$((CH_3)_3CCH_2)_3Sn$	13356-21-3	**	8.58 ± 0.1 (V)	PE	4242
			**	8.67 (V)	PE	5571
$C_{21}H_{20}Sn^+$	$(C_6H_5)_3Sn$ (Stannane, tetraphenyl-)	595-90-4	**	8.34 ± 0.03	PI	4055
$C_6H_{18}Sn_2^+$	$((CH_3)_3Sn)_2$	661-69-8	**	8.02 ± 0.15	EI	3548
$C_8H_{22}Sn_2^+$	$((CH_3)_3Sn)_2CHCH_3$	XXXXX-XX-X	**	8.25 (V)	PE	4457
	$(CH_3)_3Sn(CH_2)_2Sn(CH_3)_3$	56580-70-2	**	8.06 (V)	PE	4457
$C_9H_{21}Sn_2^+$	$(CH_3)_3Sn(CH_2)_3Sn(CH_3)_3$	35434-81-2	**	9.46 (V)	PE	4457
$C_{13}H_{28}Sn_2^+$	$C_7H_{10}(Sn(CH_3)_3)_2$ (Stannane, bicyclo[2.2.1]heptane-2,3-diylbis(trimethyl-, (2-endo, 3-exo)-)	56580-71-3	**	8.0 (V)	PE	4457
	$(N(CH_3)_2)_2Sn$	1066-77-9	**	7.67 (V)	PE	4588
$B_2C_7H_{21}N_3Sn^+$	$N_3B_2(CH_3)_4(CH_3)_3Sn$ (1,2,4,3,5-Triazadiborolidine, 1,2,3,5-tetramethyl-4-(trimethylstannyl)-)	53246-13-2	**	7.28 (V)	PE	4526
	$N_3B_2(CH_3)_4(CH_3)_3Sn$ (1,2,4,3,5-Triazadiborolidine, 1,3,4,5-tetramethyl-2-(trimethylstannyl)-)	53246-19-8	**	7.27 (V)	PE	4526
OSn^+	SnO	21651-19-4	**	9.5 ± 1	EI	3819
$C_{13}H_{11}OSn^+$	$C_{12}H_9OSn(CH_3)_2$ (10 <i>H</i> -Phenoxastannin, 10,10-dimethyl-)	1802-94-4	CH_3	9.4	EI	4228
	$C_{21}H_{11}O_2Sn_3(CH_3)_1$ (10 <i>H</i> ,20 <i>H</i> -Tetrabenzo[<i>b,e,h,k</i>][1,7,4,10]dioxadistannacyclododecin, 10,10,20,20-tetramethyl-)	51452-88-1	CH_3	9.40	EI	4228
			CH_3	8.5 ± 0.1	EI	4664
				11.05	EI	4228
$C_{11}H_{11}OSn^+$	$C_{12}H_9OSn(CH_3)_2$ (10 <i>H</i> -Phenoxastannin, 10,10-dimethyl-)	1802-94-4	**	8.1	EI	4228
	$C_{12}H_9OSn(CH_3)_2$ (10 <i>H</i> -Phenoxastannin, 10,10-dimethyl-)	1802-94-4	**			

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{11}H_{11}OSn^+$	$C_{12}H_8OSn(CH_3)_2$	1802-94-4	**	8.0 ± 0.1	EI	4664
$C_{12}H_{20}O_1Sn^+$	$C_{12}H_{20}O_1Sn$ (Tin,dimethylbis(2,4-pentanedionato- O,O')-(OC-6-21)-)	40866-48-6	**	8.35 (V)	PE	5103
$C_8H_{13}NOSn^+$	$C_7H_4N(O)Sn(CH_3)_3$ (Pyridine, 4-(trimethylstannyl)-, 1-oxide)	28867-09-6	**	8.04 (V)	PE	4222
F_2Sn^+	SnF_2	7783-47-3	**	8.0 ± 0.1	PE	5054
$C_6H_{18}SiSn^+$	$((CH_3)_3Si)(CH_3)_3Sn$	16393-88-7	**	8.18 ± 0.14	EI	3548
$C_{11}H_{38}Si_4Sn^+$	$(CH(Si(CH_3)_3)_2)_3Sn$	41823-72-7	**	7.42 ± 0.05 (V)	PE	4725
$C_{16}H_{11}Si_4Sn^+$	$((CH_3)_3SiCH_2)_4Sn$	18547-12-1	**	8.71 ± 0.1 (V)	PE	3830
$C_{11}H_{36}N_2Si_2Sn^+$	$C_{11}H_{36}N_2Si_2Sn$ ($N(Si(CH_3)_3)(tert-C_4H_9)_2Sn$)	55147-80-3	**	7.26 ± 0.05 (V)	PE	4725
		XXXXX-XX-X	**	7.25 (V)	PE	4157
$C_{12}H_{36}N_2Si_1Sn^+$	$(N(Si(CH_3)_3)_2)_2Sn$	55147-78-9	** **	7.75 ± 0.05 (V) 7.75 ± 0.05 (V)	PE PE	4725 4725
SSn^+	SnS	1314-95-0	**	9.42 (V)	PE	4967
$(^2\Pi_{1/2,3/2})$ $(^2\Sigma, ^2\Pi)$			**	10.20 (V)	PE	4550
			**	9.7 ± 0.5 (V)	EI	4550
$C_1H_{12}SSn^+$	$(CH_3)_3SCH_3Sn$	993-46-4	**	8.37 ± 0.05 (V)	PE	4153
$C_8H_{11}SSn^+$	$C_6H_5SSn(CH_3)_3$ (Stannane, trimethyl(phenylthio)-)	1007-27-8	CH_3	9.22 ± 0.1	EI	4198
$C_9H_{11}SSn^+$	$C_6H_5S(CH_3)_4Sn$ (Stannane, trimethyl(phenylthio)-)	1007-27-8	**	8.40 ± 0.05 (V)	PE	4589
			**	7.87 ± 0.1	EI	4198
$C_{10}H_{16}SSn^+$	$C_6H_5(SCH_3)_2Sn(CH_3)_3$ (Stannane, trimethyl[4-(methylthio)phenyl]-)	17113-79-0	**	7.87 ± 0.05 (V)	PE	4627
	$C_6H_5SCH_2Sn(CH_3)_3$ (Stannane, trimethyl[(phenylthio)methyl]-)	59163-59-6	**	7.74 ± 0.05 (V)	PE	4627
$C_{11}H_{18}SSn^+$	$C_{11}H_{18}SSn$ (Stannane, trimethyl[[4-(methylthio)phenyl]methyl]-)	59163-58-5	**	7.70 ± 0.05 (V)	PE	4627
$C_{13}H_{11}SSn^+$	$C_{12}H_9SSn(CH_3)_2$ (10 <i>H</i> -Phenothiaastannin, 10,10-dimethyl-)	42371-86-8	CH_3	9.4	EI	4228
			CH_3	8.9 ± 0.1	EI	4664

Ion	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{11}H_{11}SSn^+$	$C_{12}H_8SSn(CH_3)_2$ (10 <i>H</i> -Phenothiaastannin, 10,10-dimethyl-)	42371-86-8	**	8.1	EI	4228
			**	8.0 ± 0.1	EI	4664
$C_1H_{10}S_2Sn^+$	$C_2H_4S_2Sn(CH_3)_2$ (1,3,2-Dithiaastannolane, 2,2-dimethyl-)	1072-55-5	**	8.70 (V)	PE	5369
$C_3H_{12}S_2Sn^+$	$C_2H_4S_2Sn(CH_3)_3$ (1,3,2-Dithiaastannolane, 2,2,4-trimethyl-)	61235-66-3	**	8.15 (V)	PE	5369
$C_7H_{16}S_2Sn^+$	$C_2H_4S_2Sn(CH_3)(C_2H_5)_2$ (1,3,2-Dithiaastannolane, 2,2-diethyl-4-methyl-)	69032-03-7	**	7.98 (V)	PE	5369
$C_{11}H_{21}S_2Sn^+$	$C_2H_4S_2Sn(CH_3)(C_4H_9)_2$ (1,3,2-Dithiaastannolane, 2,2-dibutyl-4-methyl-)	61235-67-4	**	7.65 (V)	PE	5369
$C_1H_8S_1Sn^+$	$C_2H_4S_2SnS_2C_2H_4$ (1,4,6,9-Tetrathia-5-stannaspiro[4.4]nonane)	176-56-7	**	8.77 (V)	PE	5369
$C_6H_{12}S_1Sn^+$	$C_2H_4S_2(CH_3)SnS_2C_2H_4(CH_3)$ (1,4,6,9-Tetrathia-5-stannaspiro[4.4]nonane, 2,7-dimethyl-)	7191-35-7	**	8.70 (V)	PE	5369
$C_6H_{18}SSn_2^+$	$((CH_3)_3Sn)_2S$	1070-91-3	**	8.22 ± 0.05 (V)	PE	4153
			**	9.2 ± 0.1	EI	4198
$C_6H_{15}NS_2Sn^+$	$(CH_3)_3(S_2CN(CH_3)_2)Sn$	33726-89-5	**	7.86 (V)	PE	5569
$C_{11}H_{25}NS_2Sn^+$	$(C_2H_5)_3(S_2CN(C_2H_5)_2)Sn$	XXXXXX-XX-X	**	7.46 (V)	PE	5569
$C_{10}H_{24}N_2S_1Sn_2^+$	$((S_2CN(CH_3)_2)(CH_3)_2Sn)_2$	XXXXXX-XX-X	**	7.70 (V)	PE	5569
$C_{22}H_{18}N_2S_1Sn_2^+$	$((S_2CN(CH_3)_2)(C_4H_9)_2Sn)_2$	XXXXXX-XX-X	**	8.01 (V)	PE	5569
$C_{13}H_{11}O_2SSn^+$	$C_{12}H_8SSn(O)_2(CH_3)_2$ (10 <i>H</i> -Phenothiaastannin, 10,10-dimethyl- 5,5-dioxide)	17068-20-1	CH ₃	9.6	EI	4228
$C_{11}H_{11}O_2SSn^+$	$C_{12}H_8SSn(O)_2(CH_3)_2$ (10 <i>H</i> -Phenothiaastannin, 10,10-dimethyl- 5,5-dioxide)	17068-20-1	**	≤ 9.3	EI	4228
$C_5H_{15}PS_2Sn^+$	$(CH_3)_3(S_2P(CH_3)_2)Sn$	XXXXXX-XX-X	**	8.60 (V)	PE	5569
$C_{12}H_{32}P_2S_1Sn_2^+$	$((CH_3)_2(S_2P(C_2H_5)_2)Sn)_2$	XXXXXX-XX-X	**	8.34 (V)	PE	5569
$C_{21}H_{56}P_2S_1Sn_2^+$	$((C_4H_9)_2(S_2P(C_2H_5)_2)Sn)_2$	XXXXXX-XX-X	**	8.35 (V)	PE	5569

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
Cl_2Sn^+	SnCl_2	7772-99-8	**	7.30 (V)	PE	4837
$(^2\text{B}_1)$			**	10.31 ± 0.05 (V)	PE	4826
$(^2\text{A}_1)$			**	10.37 ± 0.05 (V)	PE	4725
$(^2\text{B}_2)$			**	11.0 (V)	PE	4725
$(^2\text{A}_2)$			**	11.33 ± 0.05 (V)	PE	4725
$(^2\text{B}_2)$			**	12.12 ± 0.05 (V)	PE	4725
$(^2\text{A}_1)$			**	12.77 ± 0.05 (V)	PE	4725
$(^2\text{A}_1)$			**	15.90 ± 0.05 (V)	PE	4725
$(^2\text{D}_{3/2})$			**	33.48 (V)	PE	5035
$(^2\text{D}_{5/2})$			**	34.53 (V)	PE	5035
$\text{C}_2\text{H}_6\text{ClSn}^+$	$((\text{CH}_3)_2\text{SnCl})(\text{CO})_5\text{Mn}$	17501-04-1		9.74 ± 0.12	EI	5321
$\text{C}_3\text{H}_9\text{ClSn}^+$	$(\text{CH}_3)_3\text{SnCl}$	1066-45-1	**	9.90	PE	5168
			**	10.16 (V)	PE	4566
$\text{C}_9\text{H}_{13}\text{ClSn}^+$	$\text{C}_6\text{H}_5(\text{CH}_3)_2\text{SnCl}$ (Stannane, (4-chlorophenyl)trimethyl-)	14064-15-4	**	8.95 (V)	PE	4438
$\text{C}_{18}\text{H}_{15}\text{ClSn}^+$	$(\text{C}_6\text{H}_5)_3\text{SnCl}$ (Stannane, chlorotriphenyl-)	639-58-7	**	9.29 ± 0.05 (V)	PE	4620
$\text{C}_2\text{H}_6\text{Cl}_2\text{Sn}^+$	$(\text{CH}_3)_2\text{SnCl}_2$	753-73-1	**	10.43	PE	5168
$\text{C}_{10}\text{H}_{11}\text{O}_1\text{Cl}_2\text{Sn}^+$	$\text{C}_{10}\text{H}_{11}\text{O}_1\text{SnCl}_2$ (Tin, dichlorobis(2,4-pentanedionato-O,O')-)	16919-46-3	**	9.10 (V)	PE	5103
$\text{C}_8\text{H}_9\text{O}_5\text{MnSn}^+$	$\text{Mn}(\text{CO})_5\text{Sn}(\text{CH}_3)_3$	14126-94-4	**	8.63 ± 0.05	PE	4492
			**	8.24 ± 0.11	EI	5321
$\text{C}_{23}\text{H}_{15}\text{O}_3\text{MnSn}^+$	$((\text{C}_6\text{H}_5)_3\text{Sn})(\text{CO})_5\text{Mn}$ (Manganese, pentacarbonyl(triphenylstannyl)-(OC-6-22)-)	14405-84-6	**	7.94 ± 0.11	EI	5321
$\text{C}_7\text{H}_6\text{O}_3\text{ClMnSn}^+$	$((\text{CH}_3)_2\text{SnCl})(\text{CO})_5\text{Mn}$	17501-04-1	**	8.21 ± 0.12	EI	5321
$\text{C}_7\text{H}_9\text{O}_1\text{CoSn}^+$	$((\text{CH}_3)_3\text{Sn})(\text{CO})_5\text{Co}$	13964-90-4	**	8.25	PE	5321
CuSn^+	CuSn	12054-11-4	**	7.2 ± 1.0	EI	5061
Cu_2Sn^+	Cu_2Sn	52935-15-6	**	7.7 ± 1.0	EI	5061
$\text{C}_6\text{H}_{18}\text{GeSn}^+$	$(\text{CH}_3)_3\text{GeSn}(\text{CH}_3)_3$	16393-89-8	**	8.20 ± 0.10	EI	3548
SeSn^+	$(\text{X}^2\Pi_{1/2})$ SnSe	1315-06-6	**	9.0 (V)	PE	4967
Br_2Sn^+	SnBr_2	10031-24-0	**	6.84 (V)	PE	4837

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
Br₂Sn⁺						
(²B ₁)	SnBr ₂	10031-24-0	**	9.85±0.05 (V)	PE	4826
(²A ₁)			**	9.87±0.05 (V)	PE	4725
(²Br ₂)			**	10.2 (V)	PE	4725
(²A ₂)			**	10.65±0.05 (V)	PE	4725
(²B ₁)			**	11.35±0.05 (V)	PE	4725
(²A ₁)			**	12.05±0.05 (V)	PE	4725
(²A ₁)			**	15.24±0.05 (V)	PE	4725
(²D _{5/2})			**	33.15 (V)	PE	5035
(²D _{3/2})			**	34.21 (V)	PE	5035
C₃H₉BrSn⁺						
	(CH ₃) ₃ SnBr	1066-44-0	**	9.60 (V)	PE	4566
ClBrSn⁺						
	SnBrCl	13595-90-9	**	10.3±0.3	EI	3800
ClBr₃Sn⁺						
	SnBr ₃ Cl	14779-73-8	**	11.1±0.3	EI	3800
C₁₃H₂₀MoSn⁺						
	(C ₅ H ₅) ₂ (Sn(CH ₃) ₃)MoH (Molybdenum,bis(η ⁻ -2,4-cyclopentadien-1-yl)hydro(trimethylstannyl)-)	51159-64-9	**	6.48±0.11	EI	5321
C₁₉H₂₀O₁MoSn⁺						
	C ₁₉ H ₂₀ O ₁ SnMo (Molybdenum,bis(η ⁻ -2,4-cyclopentadien-1-yl)[3-methoxy-1-(methoxycarbonyl)-3-oxo-1-propenyl](trimethylstannyl)-)	51231-85-7	**	6.80±0.13	EI	5321
C₁₃H₁₉ClMoSn⁺						
	(C ₅ H ₅) ₂ (Sn(CH ₃) ₃)MoCl (Molybdenum,chlorobis(η ⁻ -2,4-cyclopentadien-1-yl)(trimethylstannyl)-)	51231-83-5	**	6.55±0.12	EI	5321
C₁₃H₁₉BrMoSn⁺						
	(C ₅ H ₅) ₂ (Sn(CH ₃) ₃)MoBr (Molybdenum,bromobis(η ⁻ -2,4-cyclopentadien-1-yl)(trimethylstannyl)-)	51231-84-6	**	6.60±0.13	EI	5321
Sb⁺						
	Sb	7440-36-0	**	8.3±0.4	EI	4111
			**	8.68±0.06	EI	3956
	Sb ₂	32679-33-7	Sb	11.5±0.5	EI	4111
Sb₂⁺						
	Sb ₂	32679-33-7	**	9.3±0.2	S	3567
			**	8.64±0.06	EI	3956
			**	8.9±0.3	EI	3961
			**	9.5±0.5	EI	3555
Sb₃⁺						
	Sb ₃	37267-70-2	**	7.50±0.13	EI	3956
			**	9.0±0.2	EI	3961
	Sb ₁	12597-17-0	Sb	10.8±0.3	EI	3961
Sb₄⁺						
	Sb ₄	12597-17-0	**	7.70±0.06	EI	3956
			**	8.4±0.3	EI	3961
			**	9.1±0.3	EI	3555
H₃Sb⁺						
	SbH ₃	7803-52-3	**	9.51	PE	3719

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_3H_9Sb^+$	$(CH_3)_3Sb$	594–10–5	**	8.48 (V)	PE	4226
$C_5H_5Sb^+$	C_5H_5Sb (Antimonin)	289–75–8	**	8.3 (V)	PE	3832
$C_6H_5Sb^+$	$(C_6H_5)_3Sb$ (Stibine, triphenyl–)	603–36–1		8.7 ± 0.1	PI	4325
$C_{12}H_{10}Sb^+$	$(C_6H_5)_3Sb$ (Stibine, triphenyl–)	603–36–1		9.0 ± 0.1	PI	4325
$C_{18}H_{15}Sb^+$	$(C_6H_5)_3Sb$ (Stibine, triphenyl–)	603–36–1	**	7.26 ± 0.05	PI	4325
			**	7.80 ± 0.01	PE	4154
			**	8.08 ± 0.05 (V)	PE	4368
$O_6Sb_4^+$	Sb_4O_6	72926–13–7	**	9.31 (V)	PE	5343
F_3Sb^+	SbF_3	7783–56–4	**	12.61 ± 0.1	EI	3578
PSb^+	SbP	25889–81–0	**	9.9 ± 0.3	EI	3596
Cl_3Sb^+	$SbCl_3$	10025–91–9	**	10.70 (V)	PE	5473
			**	10.73	PE	4146
$C_{21}H_{22}MnSb^+$	$C_{20}H_{22}O_2MnSb$ (Manganese,dicarbonyl[(1,2,3,4,5– η)–1–methyl–2,4–cyclopentadien–1–yl](triphenylstibine)–)	XXXXXX–XX–X	2CO	8.38 ± 0.03	EI	5576
	$C_{20}H_{22}OSMnSb$ (Manganese,(carbonothioyl)carbonyl[(1,2,3,4,5– η)–1–methyl–2,4–cyclopentadien–1–yl](triphenylstibine)–)	XXXXXX–XX–X	CO + CS	8.83 ± 0.03	EI	5576
$C_{23}H_{22}OMnSb^+$	$(CH_3C_3H_4)(CO)_2((C_6H_5)_3Sb)Mn$ (Manganese,dicarbonyl[(1,2,3,4,5– η)–1–methyl–2,4–cyclopentadien–1–yl](triphenylstibine)–)	XXXXXX–XX–X	CO	8.46 ± 0.04	EI	5576
$C_{26}H_{22}O_2MnSb^+$	$(CH_3C_3H_4)(CO)_2((C_6H_5)_3Sb)Mn$ (Manganese,dicarbonyl[(1,2,3,4,5– η)–1–methyl–2,4–cyclopentadien–1–yl](triphenylstibine)–)	XXXXXX–XX–X	**	6.37 ± 0.03	EI	5576
$C_{25}H_{22}SMnSb^+$	$C_{20}H_{22}OSMnSb$ (Manganese,(carbonothioyl)carbonyl[(1,2,3,4,5– η)–1–methyl–2,4–cyclopentadien–1–yl](triphenylstibine)–)	XXXXXX–XX–X	CO	7.30 ± 0.04	EI	5576
$C_{26}H_{22}OSMnSb^+$	$C_{20}H_{22}OSMnSb$ (Manganese,(carbonothioyl)carbonyl[(1,2,3,4,5– η)–1–methyl–2,4–cyclopentadien–1–yl](triphenylstibine)–)	XXXXXX–XX–X	**	6.61 ± 0.03	EI	5576

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
SbGa⁺	SbGa	12064-03-8	**	7.6±1.0	EI	4111
Br₃Sb⁺	SbBr ₃	7789-61-9	**	9.77 (V)	PE	4146
			**	10.07 (V)	PE	5473
C₂₃H₁₅O₅MoSb⁺	(C ₆ H ₅) ₃ (CO) ₅ SbMo (Molybdenum, pentacarbonyl(triphenylstibine)-(OC-6-22)-)	19212-21-6	**	7.90±0.05	EI	4600
Te₂⁺	(²Π _{g,1/2}) Te ₂	10028-16-7	**	8.05	PE	5475
	(²Π)		**	8.22 (V)	PE	4643
	(²Π _{g,1/2})		**	8.30 (V)	PE	4662
	(²Π _{g,3/2})		**	8.77 (V)	PE	4662
	(¹Π _μ)		**	9.42 (V)	PE	4662
	(¹Π _μ)		**	9.44 (V)	PE	4643
			**	10.10 (V)	PE	4662
	(¹Σ _g ⁻)		**	11.02 (V)	PE	4662
			**	11.58 (V)	PE	4662
	(²Σ _g ⁻)		**	11.87 (V)	PE	4662
			**	12.42 (V)	PE	4662
Te₃⁺	Te ₃	50645-41-5	**	9.3	EI	5294
Te₄⁺	Te ₄	12597-49-8	**	9.5	EI	5294
Te₅⁺	Te ₅	50645-42-6	**	7.4	EI	5294
Te₆⁺	Te ₆	XXXXX-XX-X	**	7.2	EI	5294
HTe⁺	TeH	13940-36-8	**	9.09	S	3742
	H ₂ Te	7783-09-7	H	11.9±0.2	EI	4610
H₂Te⁺	(²B ₁)	7783-09-7	**	9.14	PE	3719
	(²A ₁)		**	11.63	PE	3719
	(²B ₂)		**	13.04	PE	3719
	(²A ₁)		**	18.6 (V)	PE	3719
			**	9.2±0.1	EI	4610
C₂H₆Te⁺	(CH ₃) ₂ Te	593-80-6	**	7.926±0.010	S	3970
			**	7.89 (V)	PE	3656
C₁H₄Te⁺	C ₁ H ₄ Te (Tellurophene)	288-08-4	**	8.27	PE	3858
			**	8.40±0.03	PE	3804
			**	8.40±0.05 (V)	PE	4626
			**	8.60±0.1	EI	3804
			**	8.32	CTS	4382
C₁H₈Te⁺	C ₁ H ₈ Te (Tellurophene, tetrahydro-)	3465-99-4	**	7.73 (V)	PE	4145

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₃H₆Te⁺	C ₃ H ₅ TeCH ₃ (Tellurophene, 2-methyl-)	35246-25-4	**	8.20±0.05 (V)	PE	4626
			**	8.25±0.1	EI	3804
			**	8.22	CTS	4382
C₇H₈Te⁺	C ₆ H ₅ TeCH ₃ (Benzene,(methyltelluro)-)	872-89-9	**	7.6 (V)	PE	5520
C₈H₆Te⁺	C ₈ H ₆ Te (Benzo[b]tellurophene)	272-35-5	**	7.76±0.05	PE	4435
OTe⁺ (² Π _{1/2}) (² Π _{3/2}) (¹ Π) (² Π + ¹ Σ) (² Σ) (² Π?) (² Π)	TeO	13451-17-7	**	8.72 (V)	PE	4643
			**	9.32 (V)	PE	4643
			**	10.80 (V)	PE	4643
			**	11.17 (V)	PE	4643
			**	12.00 (V)	PE	4643
			**	12.7 (V)	PE	4643
			**	13.49 (V)	PE	4643
O₂Te⁺ (² A ₁ + ² A ₂ + ² B ₂) TeO ₂		59863-17-1	**	11.17 (V)	PE	4643
			**	12.7 (V)	PE	4643
			**	13.49 (V)	PE	4643
C₃H₄OTe⁺	C ₃ H ₄ TeCHO (2-Tellurophenecarboxaldehyde)	35273-64-4	**	8.88±0.1	EI	3804
C₆H₆OTe⁺	C ₆ H ₅ TeCOCH ₃ (Ethanone, 1-tellurophene-2-yl-)	35273-65-5	**	8.60±0.1	EI	3804
C₁₂H₈OTe⁺	C ₁₂ H ₈ OTe (Phenoxatellurin)	262-24-8	**	7.61±0.05 (V)	PE	4743
C₃H₄O₂Te⁺	C ₃ H ₄ TeCOOH (2-Tellurophenecarboxylic acid)	35246-22-1	**	8.62±0.05 (V)	PE	4626
			**	8.80±0.1	EI	3804
C₆H₆O₂Te⁺	C ₆ H ₅ TeCOOCH ₃ (2-Tellurophenecarboxylic acid methyl ester)	35246-23-2	**	8.51±0.05 (V)	PE	4626
			**	8.64±0.1	EI	3804
C₇H₉NOTe⁺	C ₇ H ₉ TeCON(CH ₃) ₂ (2-Tellurophenecarboxamide, N,N-dimethyl-)	55685-52-4	**	8.39±0.05 (V)	PE	4626
Si₂H₆Te⁺	(SiH ₃) ₂ Te	19415-73-7	**	8.63 (V)	PE	3656
PTe⁺	TeP	51890-39-2	**	7.8±1.0	EI	4001
C₇H₅STe⁺	C ₇ H ₅ STe (1,4-Thiatellurin)	3092-46-4	**	7.9±0.1 (V)	PE	4841

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_5H_6STe^+$	$C_4H_5TeSCH_3$ (Tellurophene, 2-(methylthio)-)	51299-95-7	**	8.15 ± 0.1	EI	3804
$C_4H_3ClTe^+$	C_4H_3TeCl (Tellurophene, 2-chloro-)	59163-66-5	**	8.68 ± 0.05 (V)	PE	4626
$GeTe^+$ ($X^2\Pi_{3/2}$)	GeTe	12025-39-7	**	9.1 (V)	PE	4967
$H_6Ge_2Te^+$	$(GeH_3)_2Te$	24312-07-0	**	8.34 (V)	PE	3656
$SeTe^+$	SeTe	12067-42-4	**	8.8 ± 0.3	EI	4682
$C_4H_3BrTe^+$	C_4H_3TeBr (Tellurophene, 2-bromo-)	59163-67-6	**	8.59 ± 0.05 (V)	PE	4626
$SnTe^+$ ($^2\Pi_{3/2}$)	SnTe	12040-02-7	**	8.61 (V)	PE	4967
($^2\Pi_{3/2}$)			**	8.65 (V)	PE	4550
($^2_{1/2}$)			**	8.95 (V)	PE	4550
($^2\Pi$)			**	9.39 (V)	PE	4550
I^+ (3P_2)	$I(^2P^o_{3/2})$	14362-44-8	**	10.43 ± 0.02	PE	5087
(3P_2)			**	10.45	PE	5178
(3P_0)			**	11.23 ± 0.02	PE	5087
(3P_0)			**	11.25	PE	5178
(3P_1)			**	11.30 ± 0.02	PE	5087
(3P_1)			**	11.33	PE	5178
(1D_2)			**	12.13 ± 0.02	PE	5087
(1D_2)			**	12.15	PE	5178
			**	10.5	EI	5177
	I_2	7553-56-2	I	13.0	EI	5177
	HI	10034-85-2		13.49 ± 0.13	PI	4991
	CH_2I_2	75-11-6	CH_2I	13.2 ± 0.1	EI	3442
			CH_2I	13.8	EI	3490
	AgI	7783-96-2	Ag	11.1	EI	4313
I_2^+ ($^2\Pi_{3/2g}$)	I_2	7553-56-2	**	9.311 ± 0.002	PE	3870
($^2\Pi_{1/2g}$)			**	9.953 ± 0.002	PE	3870
			**	9.5	EI	5177
	Ag_3I_3	37375-12-5		10.2	EI	4313
	WO_2I_2	14447-89-3		15.0 ± 0.8	EI	3451
I_2^{+2}	I_2	7553-56-2	**	25.5 ± 0.4	EI	4052
				25.5 ± 0.4	EI	4311
HI^+ ($^2\Pi_{1/2}$)	HI	10034-85-2	**	10.386 ± 0.001	S	4991
($^2\Pi_{1/2}$)			**	11.0495 ± 0.001	S	4991
DI^+ ($^2\Pi_{1/2}$)	DI	14104-45-1	**	10.387	S	4991
($^2\Pi_{1/2}$)			**	11.0505 ± 0.001	S	4991

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
LiI^+	LiI	10377-51-2	**	8.44 ± 0.03 (V)	PE	4950
Li_2I_2^+	$(\text{LiI})_2$	37279-36-0	**	9.23 ± 0.06 (V)	PE	4950
$\text{H}_8\text{B}_3\text{I}^+$	$\text{B}_5\text{H}_9\text{I}$ (Pentaborane(9), 1-iodo-)	30624-33-0	**	9.06 (V)	PE	4519
	$\text{B}_5\text{H}_9\text{I}$ (Pentaborane(9), 2-iodo-)	20199-87-5	**	9.30 (V)	PE	4519
C_4I_2^+	$\text{Cl} \equiv \text{CC} \equiv \text{Cl}$	53214-97-4	**	8.76 ± 0.02	PE	4162
CH_2I^+	CH_2I_2	75-11-6	**	10.55 ± 0.02	PI	4640
CH_3I^+	CH_3I	74-88-4	**	9.538	S	3748
			**	9.538	S	5245
			**	9.533 ± 0.01	PI	4640
			**	9.52	PE	3532
			**	9.53 (V)	PE	5249
			**	9.54	PE	4194
			**	9.9 (V)	PE	4193
			**	10.14	PE	3532
			**	9.48 ± 0.03	EI	3626
C_2HI^+	$\text{CH} \equiv \text{Cl}$	14545-08-5	**	9.7397	S	3751
$\text{C}_2\text{H}_3\text{I}^+$	$\text{C}_2\text{H}_3\text{I}$	593-66-8	**	9.296	S	5145
			**	9.32 (V)	PE	4194
			**	9.33	PE	3863
			**	9.35 (V)	PE	4310
			**	9.32	PE	4542
$\text{C}_2\text{H}_5\text{I}^+$	$\text{C}_2\text{H}_5\text{I}$	75-03-6	**	9.346	S	3748
			**	9.33 (V)	PE	5249
			**	9.34 (V)	PE	4076
			**	9.34 (V)	PE	5088
			**	9.35	PE	3532
			**	9.35	PE	4194
			**	9.45 ± 0.02 (V)	PE	3987
$\text{C}_3\text{H}_3\text{I}^+$	$\text{CH}_3\text{C} \equiv \text{Cl}$	624-66-8	**	9.18 ± 0.02	PE	4765
				9.20	EI	5282
$\text{C}_3\text{H}_5\text{I}^+$	$\text{CH}_2\text{CHCH}_2\text{I}$	556-56-9	**	9.298	S	5145
			**	9.25 (V)	PE	4260
			**	9.30	PE	4091
			**	9.30 (V)	PE	3863
			**	9.32 (V)	PE	4194
			**	9.37	PE	5145

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_3H_7I^+$	<i>n</i> -C ₃ H ₇ I	107-08-4	**	9.269	S	3748
			**	9.26	PI	5069
			**	9.25	PE	3532
			**	9.26	PE	4194
			**	9.27	PE	4076
	<i>iso</i> -C ₃ H ₇ I	75-30-9	**	9.5 (V)	PE	4193
			**	9.175	S	5145
			**	9.18	PI	5069
			**	9.18	PE	4194
			**	9.18	PE	5145
			**	9.19	PE	3532
			**	9.4 (V)	PE	4193
			**	9.2 ± 0.1	EI	3735
C_4HI^+	CH≡CC≡CI	6088-91-1	**	9.24 ± 0.02	PE	4162
$C_4H_3I^+$	CH ₂ CHC≡CI	40589-39-7	**	8.94 ± 0.02	PE	4374
$C_4H_9I^+$	<i>n</i> -C ₄ H ₉ I	542-69-8	**	9.229	S	3748
			**	9.23	PE	3532
			**	9.23	PE	4194
			**	9.24	PE	4076
			**	9.5 (V)	PE	4193
	<i>sec</i> -C ₄ H ₉ I	513-48-4	**	9.4 (V)	PE	4193
			**	9.202	S	5145
	<i>iso</i> -C ₄ H ₉ I	513-38-2	**	9.20	PE	4194
			**	9.20	PE	5145
			**	9.4 (V)	PE	4193
			**	9.04	PE	5145
			**	9.04	PE	4194
			**	9.08	PE	3532
			**	9.4 (V)	PE	4193
$C_5H_3I^+$	CH ₃ C≡CC≡CI	40201-91-0	**	8.82 ± 0.02	PE	4162
$C_5H_9I^+$	C ₅ H ₉ I (Cyclopentane, iodo-)	1556-18-9	**	9.076	S	5145
			**	9.07	PE	4194
			**	9.07	PE	5145
$C_5H_{11}I^+$	CH ₂ ICH ₂ CH(CH ₃) ₂	541-28-6	**	9.192	S	5145
			**	9.20	PE	4194
			**	9.20	PE	5145
	<i>n</i> -C ₅ H ₁₁ I	628-17-1	**	9.201	S	3748
			**	9.20	PE	4194
			**	9.22	PE	3532
			**	9.4 (V)	PE	4193
$C_6H_5I^+$	C ₆ H ₅ I (Benzene, iodo-)	591-50-4	**	8.67	PE	4194
			**	8.67 (V)	PE	5125
			**	8.70	PE	4621
			**	8.801 (V)	PE	5257
			**	9.05	EI	4834

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_6H_{11}I^+$	$C_6H_{11}I$ (Cyclohexane, iodo-)	626-62-0	**	9.003	S	5145
			**	8.91	PE	4194
			**	8.91	PE	5145
$C_6H_{13}I^+$	$n-C_6H_{13}I$	638-45-9	**	9.179	S	3748
			**	9.20	PE	1494
$C_7H_7I^+$	$C_6H_5CH_2I$ (Benzene, (iodomethyl)-)	620-05-3	**	8.91 (V)	PE	3992
			**	8.53 ± 0.1	EI	3777
	$C_6H_4ICH_3$ (Benzene, 1-iodo-2-methyl-)	615-37-2	**	8.55 ± 0.1	EI	3777
			**	8.38	PE	4621
	$C_6H_4ICH_3$ (Benzene, 1-iodo-4-methyl-)	624-31-7	**	8.60 ± 0.1	EI	3777
$C_8H_5I^+$	$C_6H_5C \equiv CI$ (Benzene, (iodoethynyl)-)	932-88-7	**	8.55 (V)	PE	4334
			**	8.52 ± 0.05 (V)	PE	5019
$C_{11}H_9I^+$	$C_{11}H_9(I)$ (1,4-Methanonaphthalene, 1,4-dihydro-5-iodo-)	63608-69-5	**	8.29 ± 0.05 (V)	PE	5019
	$C_{11}H_9(I)$ (1,4-Methanonaphthalene, 1,4-dihydro-6-iodo-)	63509-78-4	**			
$C_{12}H_9I^+$	$C_{12}H_9I$ (1,1'-Biphenyl, 2-iodo-)	2113-51-1	**	8.20 ± 0.02	PE	3702
			**	9.77 ± 0.02	PI	4640
CHI_2^+	CHI_3	75-47-8	**	9.46 ± 0.02	PI	4640
			**	9.25 ± 0.02	PI	4640
$CH_2I_2^+$	CH_2I_2	75-11-6	**	8.94 (V)	PE	4310
			**	8.92 (V)	PE	4310
			**	8.92 (V)	PE	3648
$C_2H_4I_2^+$	<i>cis</i> - $CHI=CHI$	590-26-1	**	9.50 ± 0.02 (V)	PE	4367
	<i>trans</i> - $CHI=CHI$	590-27-2	**			
$C_6H_4I_2^+$	$C_6H_4I_2$ (Benzene, 1,4-diiodo-)	624-38-4	**	8.60 (V)	PE	5257
			**	9.21	PE	5198
CHI_3^+	CHI_3	75-47-8	**	9.16 (V)	PE	5553
			**			
$BC_2H_6I^+$	$(CH_3)_2IB$	17933-09-4	**			
			**			
$B_1C_2H_5I^+$	$C_2B_2H_5I$ (1,6-Dicarbaheptaborane(6),2-iodo-)	38744-24-0	**			
			**			

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
B₁C₂H₁I₂⁺	C ₂ B ₁ H ₁ I ₂ (1,6-Dicarbahexaborane(6),2,4-diiodo-)	XXXXX-XX-X **		8.86 (V)	PE	5553
C₃NI⁺	Cl≡CCN	2003-32-9	**	10.18±0.02	PE	4765
C₆H₆NI⁺	C ₆ H ₅ INH ₂ (Benzenamine, 2-iodo-)	615-43-0	**	8.35	EI	4834
	C ₆ H ₄ (I)NH ₂ (Benzenamine, 4-iodo-)	540-37-4	**	7.51	PE	4621
	C ₆ H ₄ INHCOCH ₃ (Acetamide, <i>N</i> -(2-iodophenyl)-)	19591-17-4	CH ₂ =C=O	10.48±0.03	EI	3483
	C ₆ H ₄ INHCOCH ₃ (Acetamide, <i>N</i> -(4-iodophenyl)-)	622-50-4	CH ₂ =C=O	9.72±0.03	EI	3483
C₇H₁NI⁺	C ₆ H ₄ (I)CN (Benzonitrile, 4-iodo-)	3058-39-7	**	9.13	PE	4621
C₇H₁₂NI⁺	C ₇ H ₁₂ NI (1-Azabicyclo[2.2.2]octane, 4-iodo-)	27701-90-2	**	8.35±0.015 (V)	PE	4286
C₁₃H₁₀NI⁺	C ₆ H ₄ IC(=CH ₂)C ₅ H ₅ N (Pyridine,2-[1-(2-iodophenyl)ethenyl]-)	XXXXX-XX-X **		8.3	OTH	5570
C₉H₁₀N₂I⁺	C ₆ H ₄ (I)N=CHN(CH ₃) ₂ (Methanimidamide, <i>N'</i> -(2-iodophenyl)- <i>N,N</i> -dimethyl-)	53666-10-7	H	8.7	EI	4337
C₉H₁₁N₂I⁺	C ₆ H ₄ (I)N=CHN(CH ₃) ₂ (Methanimidamide, <i>N'</i> -(2-iodophenyl)- <i>N,N</i> -dimethyl-)	53666-10-7	**	7.3	EI	4337
C₂₅H₂₅N₂I⁺	C ₂₅ H ₂₅ N ₂ I (Quinolinium, 1-ethyl-2-[3-(1-ethyl-2(1 <i>H</i>)-quinolinylidene)-1-propenyl]-, iodide)	605-91-4	**	7.25	PI	3586
C₂₉H₃₅N₂I⁺	C ₂₉ H ₃₅ N ₂ I (Quinolinium, 1-(3-methylbutyl)-4-[[1-(3-methylbutyl)-4(1 <i>H</i>)-quinolinylidene]methyl]-, iodide)	523-42-2	**	7.35	PI	3586
BC₁H₁₂N₂I⁺	((CH ₃) ₂ N) ₂ BI	7318-71-0	**	8.11 (V)	PE	3704
BC₂H₆NI₂⁺	(CH ₃) ₂ NBI ₂	7318-72-1	**	8.95 (V)	PE	3704
C₂H₃OI⁺	CH ₂ ICH ₂ OH	624-76-0	**	9.66±0.07 (V)	PE	3987
	CH ₂ ICH ₂ OH- <i>gauche</i>	XXXXX-XX-X **	**	9.73 (V)	PE	5088
	<i>trans</i> -CH ₂ ICH ₂ OH	XXXXX-XX-X **	**	9.60 (V)	PE	5088
C₃H₇OI⁺	CH ₂ ICH ₂ OCH ₃	4296-15-5	**	9.43±0.04 (V)	PE	3987
	CH ₂ ICH ₂ OCH ₃ - <i>gauche</i>	XXXXX-XX-X **	**	9.43 (V)	PE	5088
	<i>trans</i> -CH ₂ ICH ₂ OCH ₃	XXXXX-XX-X **	**	9.40 (V)	PE	5088

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₆H₅OI⁺	C ₆ H ₅ (I)OH (Phenol, 4-iodo-)	540-38-5	**	8.06	PE	4621
	C ₆ H ₅ IOOCCH ₃ (Phenol, 2-iodo-, acetate)	32865-61-5	CH ₂ =C=O	9.72±0.03	EI	3483
	C ₆ H ₅ IOOCCH ₃ (Phenol, 4-iodo-, acetate)	33527-94-5	CH ₂ =C=O	9.38±0.03	EI	3483
C₇H₇OI⁺	C ₆ H ₅ IOCH ₃ (Benzene, 1-iodo-4-methoxy-)	696-62-8	**	7.97	PE	4621
C₂H₃O₂I⁺	CH ₂ ICOOH	64-69-7	**	11.03 (V)	PE	3874
C₈H₇O₂I⁺	C ₆ H ₅ (I)COOCH ₃ (Benzoic acid, 4-iodo-, methyl ester)	619-44-3	**	8.73	PE	4621
	C ₆ H ₅ IOOCCH ₃ (Phenol, 2-iodo-, acetate)	32865-61-5	**	8.25±0.03	EI	3483
	C ₆ H ₅ IOOCCH ₃ (Phenol, 4-iodo-, acetate)	33527-94-5	**	8.20±0.03	EI	3483
C₆H₄OI₂⁺	C ₆ H ₃ I ₂ OOCCH ₃ (Phenol, 2,4-diiodo-, acetate)	36914-80-4	CH ₂ =C=O	8.94±0.03	EI	3480
	C ₆ H ₃ I ₂ OOCCH ₃ (Phenol, 2,6-diiodo-, acetate)	28165-73-3	CH ₂ =C=O	9.18±0.03	EI	3480
C₈H₆O₂I₂⁺	C ₆ H ₃ I ₂ OOCCH ₃ (Phenol, 2,4-diiodo-, acetate)	36914-80-4	**	7.90±0.03	EI	3480
	C ₆ H ₃ I ₂ OOCCH ₃ (Phenol, 2,6-diiodo-, acetate)	28165-73-3	**	8.07±0.03	EI	3480
CNOI⁺	INCO	3607-48-5	**	9.89±0.01	PE	5001
C₈H₈NOI⁺	C ₆ H ₅ INHCOCH ₃ (Acetamide, N-(2-iodophenyl)-)	19591-17-4	**	8.45	EI	4834
	C ₆ H ₅ INHCOCH ₃ (Acetamide, N-(4-iodophenyl)-)	622-50-4	**	7.98±0.03	EI	3483
			**	7.87±0.03	EI	3483
C₁₂H₈NOI⁺	C ₆ H ₅ ICOC ₂ H ₅ N (Methanone, (2-iodophenyl)-2-pyridinyl-)	XXXXX-XX-X	**	8.76	EI	5459
C₇H₇N₂OI⁺	C ₆ H ₅ INHCONH ₂ (Urea, (2-iodophenyl)-)	13114-93-7	**	8.30	EI	4834
C₆H₄NO₂I⁺	C ₆ H ₄ (I)NO ₂ (Benzene, 1-iodo-4-nitro-)	636-98-6	**	9.24	PE	4621
FI⁺	IF	13873-84-2	**	10.54±0.01	PE	4755
			**	11.24±0.01	PE	4755
			**	15.22±0.01 (V)	PE	4755
			**	15.94±0.01 (V)	PE	4755

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
F_3I^+	IF_3	7783-66-6	**	12.943 ± 0.005	PE	3655
CF_3I^+	CF_3I	2314-97-8	**	10.45 ± 0.05 (V)	PE	4727
$\text{C}_3\text{F}_3\text{I}^+$	$\text{CF}_3\text{C}\equiv\text{Cl}$	39130-85-3	**	10.17 ± 0.02	PE	4765
$\text{C}_2\text{F}_5\text{I}^+$	$\text{C}_2\text{F}_5\text{I}$	354-64-3	**	10.66 ± 0.1	EI	4862
$\text{C}_6\text{F}_5\text{I}^+$	$\text{C}_6\text{F}_5\text{I}$ (Benzene,pentafluoroiodo-)	827-15-6	**	9.54 (V)	PE	5252
$\text{C}_2\text{F}_4\text{I}_2^+$	$(\text{CF}_2\text{I})_2$	354-65-4	**	10.11 ± 0.01 (V)	PE	4613
$\text{C}_2\text{H}_2\text{F}_3\text{I}^+$	$\text{CF}_3\text{CH}_2\text{I}$	353-83-3	**	9.998	S	5145
NaI^+	NaI	7681-82-5	**	7.64 ± 0.02	PI	3536
			**	7.60 ± 0.1	PE	4344
			**	7.60 ± 0.1	PE	5035
			**	8.0 (V)	PE	4307
			**	9.21 ± 0.04 (V)	PE	4344
			**	9.21 ± 0.04 (V)	PE	5035
MgI_2^+	MgI_2	10377-58-9	**	9.57 ± 0.03	PI	3536
			**	10.5 (V)	PE	4761
AlI^+	AlI	29977-41-1	**	9.3 ± 0.3	EI	5067
AlI_3^+	AlI_3	7784-23-8	**	9.66 (V)	PE	4398
			**	9.66 (V)	PE	4256
$\text{C}_2\text{H}_6\text{AlI}^+$	$(\text{CH}_3)_2\text{IAI}$	2938-72-9	**	9.48 (V)	PE	4398
$\text{CH}_3\text{AlI}_2^+$	$\text{CH}_3\text{I}_2\text{Al}$	2938-46-7	**	9.73 (V)	PE	4398
$\text{C}_4\text{H}_{12}\text{Al}_2\text{I}_2^+$	$((\text{CH}_3)_2\text{IAI})_2$	59585-02-3	**	9.38 (V)	PE	4559
H_3SiI^+	SiH_3I	13598-42-0	**	9.78 ± 0.02 (V)	PE	3510
			**	10.05 ± 0.05 (V)	PE	3502
H_2SiI_2^+	SiH_3I_2	13760-02-6	**	9.69 ± 0.02 (V)	PE	3510
$\text{C}_5\text{H}_9\text{SiI}^+$	$(\text{CH}_3)_3\text{SiC}\equiv\text{Cl}$	18163-47-8	**	9.1 ± 0.1	PE	4002
PI_3^+	PI_3	13455-01-1	**	9.15 (V)	PE	4023

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
F_2PI^+	PF_2I	13819-11-9	**	10.1 ± 0.1 (V)	PE	3662
			**	9.6 ± 0.1	EI	4305
$C_1SI_4^+$	C_1SI_4 (Thiophene, tetraiodo-)	19259-11-1	**	8.27 (V)	PE	4690
$C_1H_3SI^+$	C_1H_3SI (Thiophene, 3-iodo-)	10486-61-0	**	8.46 (V)	PE	4690
$C_1H_3SI^+$	C_1H_3SI (Thiophene, 2-iodo-)	3437-95-4	**	8.46 (V)	PE	4690
			**	8.52 ± 0.05 (V)	PE	4626
$C_6H_3S_2I^+$	$C_6H_3S_2I$ (Thieno[2,3- <i>b</i>]thiophene, 2-iodo-)	53020-10-3	**	8.18 (V)	PE	5478
	$C_6H_3S_2I$ (Thieno[2,3- <i>b</i>]thiophene, 3-iodo-)	53020-11-4	**	8.24 (V)	PE	5478
$C_1H_2SI_2^+$	$C_1H_2SI_2$ (Thiophene, 2,5-diiodo-)	625-88-7	**	8.28 (V)	PE	4690
			**	8.32	EI	3787
			**	8.35	CTS	3787
	$C_1H_2SI_2$ (Thiophene, 3,4-diiodo-)	19259-08-6	**	8.45 (V)	PE	4690
$C_8H_8NSI^+$	$C_8H_8INHCSCH_3$ (Ethanethioamide, N-(2-iodophenyl)-)	39184-84-4	**	8.10	EI	4834
$C_7H_7N_2SI^+$	$C_7H_7INHCSNH_2$ (Thiourea, (2-iodophenyl)-)	62635-52-3	**	8.15	EI	4834
ClI^+ ($^2P_{1/2}$) ($^2P_{1/2}$)	ICI	7790-99-0	**	10.088 ± 0.01	S	4027
			**	10.662 ± 0.01	S	4027
KI^+ ($^2P_{1/2}$) ($^2P_{3/2}$) ($^2P_{1/2}$)	KI	7681-11-0	**	7.21 ± 0.1	PE	4344
			**	7.21 ± 0.1	PE	5035
			**	7.4 (V)	PE	4307
			**	8.66 ± 0.04 (V)	PE	5035
CaI^+	CaI	15923-87-2	**	6.1 ± 0.3	EI	5067
CaI_2^+	CaI_2	10102-68-8	**	10.1 (V)	PE	4761
TiI_4^+	TiI_4 (JC-Mean value of Jahn-Teller components)	7720-83-4	**	9.27 (V)	PE	4694
$C_{10}H_{10}I_2Ti^+$	(η - C_5H_5) $_2TiI_2$ (Titanium, bis(η^5 -2,4-cyclopentadien-1-yl)diiodo-)	12152-92-0	**	8.0 ± 0.1 (V)	PE	4987

Table of Ion Energetics Measurements—Continued

Ion	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
MnI⁺	(C ₇ H ₇)(CS)(NO)MnI (Manganese,(carbonothioyl)(η^5 -2,4-cyclopentadien-1-yl)iodonitrosyl-)	58450-74-1		16.15±0.04	EI	5561
	(CH ₃ C ₇ H ₇)(CS)(NO)MnI (Manganese,(carbonothioyl)((1,2,3,4,5- η)-1-methyl-2,4-cyclopentadien-1-yl)iodonitrosyl-)	XXXXX-XX-X		17.11±0.03	EI	5561
C₃H₅MnI⁺	(C ₇ H ₇)(CS)(NO)MnI (Manganese,(carbonothioyl)(η^5 -2,4-cyclopentadien-1-yl)iodonitrosyl-)	58450-74-1	NO + CS	10.92±0.03	EI	5561
C₆H₇MnI⁺	(CH ₃ C ₇ H ₇)(CS)(NO)MnI (Manganese,(carbonothioyl)((1,2,3,4,5- η)-1-methyl-2,4-cyclopentadien-1-yl)iodonitrosyl-)	XXXXX-XX-X	NO + CS	10.93±0.02	EI	5561
C₃O₃MnI⁺	(CO) ₃ MnI	14879-42-6	** **	8.40±0.05 (V) 8.44-8.74 (V)	PE PE	4492 3866
CSMnI⁺	(C ₇ H ₇)(CS)(NO)MnI (Manganese,(carbonothioyl)(η^5 -2,4-cyclopentadien-1-yl)iodonitrosyl-)	58450-74-1	NO + C ₃ H ₅	13.97±0.03	EI	5561
	(CH ₃ C ₇ H ₇)(CS)(NO)MnI (Manganese,(carbonothioyl)((1,2,3,4,5- η)-1-methyl-2,4-cyclopentadien-1-yl)iodonitrosyl-)	XXXXX-XX-X		14.91±0.04	EI	5561
C₆H₅SMnI⁺	(C ₇ H ₇)(CS)(NO)MnI (Manganese,(carbonothioyl)(η^5 -2,4-cyclopentadien-1-yl)iodonitrosyl-)	58450-74-1	NO	8.81±0.02	EI	5561
C₇H₇SMnI⁺	(CH ₃ C ₇ H ₇)(CS)(NO)MnI (Manganese,(carbonothioyl)((1,2,3,4,5- η)-1-methyl-2,4-cyclopentadien-1-yl)iodonitrosyl-)	XXXXX-XX-X	NO	8.90±0.02	EI	5561
C₆H₅NOSMnI⁺	(C ₇ H ₇)(CS)(NO)MnI (Manganese,(carbonothioyl)(η^5 -2,4-cyclopentadien-1-yl)iodonitrosyl-)	58450-74-1	**	7.45±0.02	EI	5561
C₇H₇NOSMnI⁺	(CH ₃ C ₇ H ₇)(CS)(NO)MnI (Manganese,(carbonothioyl)((1,2,3,4,5- η)-1-methyl-2,4-cyclopentadien-1-yl)iodonitrosyl-)	XXXXX-XX-X	**	7.35±0.02	EI	5561
C₁O₂FeI⁺	(CO) ₂ FeI ₂	14911-55-8	**	8.76 (V)	PE	4431
C₇H₅O₂FeI⁺	C ₇ H ₅ (CO) ₂ FeI (Iron, dicarbonyl (η^5 -2,4-cyclopentadien-1-yl)iodo-)	12078-28-3	** **	7.77 (V) 7.81 (V)	PE PE	4570 4565
Cu₃I₃⁺	(CuI) ₃	67244-68-2	**	8.99±0.02 (V)	PE	4839
ZnI₂⁺	(2 ¹ Π _{3/2g})	10139-47-6	**	9.73±0.05 (V)	PE	3833
	(2 ¹ Π _{3/2g})		**	9.7 (V)	PE	3963
	(2 ¹ Π _{3/2g})		**	9.76 (V)	PE	4232
	(2 ¹ Π _{3/2u})		**	10.2 (V)	PE	3963
	(2 ¹ Π _{1/2g} , 2 ¹ Π _u)		**	10.32±0.05 (V)	PE	3833
	(2 ¹ Π _{1/2g})		**	10.32 (V)	PE	4232
	(2 ¹ Π _{1/2g})		**	10.35 (V)	PE	3963

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
ZnI₂⁺						
(² Π _{3/2u})	ZnI ₂	10139-47-6	**	10.40 (V)	PE	4232
(² Π _{1/2u})			**	10.5 (V)	PE	3963
(² Π _{1/2u})			**	10.575 (V)	PE	4232
(² Σ _u)			**	11.4 (V)	PE	3963
(² Σ _u)			**	11.45±0.05 (V)	PE	3833
(² Σ _u)			**	10.32±0.05 (V)	PE	3833
			**	11.53 (V)	PE	4232
(² Σ _g)			**	12.4 (V)	PE	3963
(² Σ _g)			**	12.74±0.05 (V)	PE	3833
(² Σ _g)			**	12.80 (V)	PE	4232
(² D _{5/2})			**	18.40 (V)	PE	4232
(² D _{3/2})			**	18.71 (V)	PE	4232
Gal⁺						
	Gal	15605-68-2	**	9.0±0.3	EI	5067
Gal₃⁺						
	Gal ₃	13450-91-4	**	9.40	PE	4215
			**	9.51 (V)	PE	4398
			**	9.51 (V)	PE	4256
GeI₁⁺						
	GeI ₁	13450-95-8	**	9.42	PE	5148
H₃GeI⁺						
	GeH ₃ I	13573-02-9	**	9.59±0.02 (V)	PE	3510
			**	9.84±0.05 (V)	PE	3502
H₂GeI₂⁺						
	GeH ₂ I ₂	14694-31-6	**	12.6±0.1 (V)	PE	3510
AsI₃⁺						
	AsI ₃	7784-45-4	**	9.00±0.04 (V)	PE	4635
			**	9.11 (V)	PE	5473
BrI⁺						
(² Π _{3/2})	IBr	7789-33-5	**	9.790±0.004	PE	3870
(² Π _{1/2})			**	10.386±0.004	PE	3870
C₆H₄BrI⁺						
	C ₆ H ₄ (I)Br (Benzene, 1-bromo-4-iodo-)	589-87-7	**	8.52	PE	4621
RbI⁺						
	RbI	7790-29-6	**	7.308±0.03	PI	3536
(² P _{3/2})			**	7.12±0.1	PE	4344
(² P _{3/2})			**	7.12±0.1	PE	5035
			**	7.3 (V)	PE	4307
(² P _{1/2})			**	8.48±0.04 (V)	PE	5035
				6.6±0.4	EI	5239
Rb₂I⁺						
	Rb ₂ I ₂	12532-37-5	I	7.674	PI	3536
			I	7.2±0.4	EI	5239
SrI⁺						
	SrI	14696-99-2	**	5.5±0.3	EI	5067
	SrI ₂	10476-86-5	**	9.5±0.3	EI	5067
SrI₂⁺						
	SrI ₂	10476-86-5	**	10.0 (V)	PE	4761

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
ZrI₁⁺	ZrI ₁ (JC-Mean value of Jahn-Teller components)	13986-26-0	**	9.55 (V)	PE	4694
C₁₀H₁₀ZrI₂⁺	(η-C ₅ H ₅) ₂ ZrI ₂ (Zirconium,bis(η ¹ -2,4-cyclopentadien-1-yl)diiodo-)	1298-41-5	**	8.1±0.1 (V)	PE	4987
C₁₂H₁₁MoI₂⁺	(η-CH(C ₅ H ₅) ₂ MoI ₂ (Molybdenum,diiodobis[(1,2,3,4,5-η)-1-methyl-2,4-cyclopentadien-1-yl]-)	63984-92-9	**	6.8±0.1 (V)	PE	4987
AgI⁺	AgI	7783-96-2	**	~8.4	PI	3536
(E _{1/2})			**	8.80 (V)	PE	5297
(E _{1/2})			**	9.27 (V)	PE	5297
(E _{1/2})			**	10.21 (V)	PE	5297
(E _{1/2})			**	13.18 (V)	PE	5297
(E _{1/2})			**	13.75 (V)	PE	5297
(E _{1/2})			**	8.8	EI	5177
(E _{1/2})			**	8.9	EI	4313
Ag₂I⁺	Ag ₂ I ₃	37375-12-5		12.1	EI	4313
	Ag ₂ I ₄	XXXXX-XX-X		11.4	EI	5177
Ag₃I₂⁺	Ag ₃ I ₃	37375-12-5	I	9.8	EI	5177
			I	10.5	EI	4313
AgI₃⁺	Ag ₃ I ₃	37375-12-5	**	9.2	EI	4313
Ag₃I₃⁺	(AgI) ₃	XXXXX-XX-X	**	10.43 (V)	PE	4981
	Ag ₃ I ₃	37375-12-5	**	9.2	EI	5177
CdI₂⁺	CdI ₂	7790-80-9	**	9.5 (V)	PE	3963
(²Π _{3/2g})			**	9.53 (V)	PE	4232
(²Π _{3/2g})			**	9.57±0.05 (V)	PE	3833
(²Π _{3/2g})			**	10.0 (V)	PE	3963
(²Π _{1/2g})			**	10.07 (V)	PE	4232
(²Π _{1/2g} , ²Π _{3/2g})			**	10.11±0.05 (V)	PE	3833
(²Π _{1/2g})			**	10.2 (V)	PE	3963
(²Π _{3/2g} , ²Π _{1/2g})			**	10.21 (V)	PE	4232
(²Π _{1/2g})			**	10.4 (V)	PE	3963
(²Σ _u)			**	11.15±0.05 (V)	PE	3833
(²Σ _u)			**	11.2 (V)	PE	3963
(²Σ _u)			**	11.20 (V)	PE	4232
(²Σ _g)			**	12.10±0.05 (V)	PE	3833
(²Σ _g)			**	12.27 (V)	PE	4232
(²Σ _g)			**	12.3 (V)	PE	3963
(²D _{5/2})			**	19.00 (V)	PE	4232
(²D _{3/2})			**	19.66 (V)	PE	4232
InI⁺	InI	13966-94-4	**	8.50	PE	3640
(²Π _{3/2})			**	8.78	PE	3640
(²Σ _{1/2})			**	8.88 (V)	PE	4713
(²Π _{5/2})			**	9.17 (V)	PE	4713
(²Π _{1/2})			**	9.46	PE	3640
(²Π _{1/2})			**	9.87 (V)	PE	4713
(²Σ)			**	11.89	PE	3640
(²Σ _{1/2})			**	12.13 (V)	PE	4713
(²D _{5/2})			**	13.75 (V)	PE	4713

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
InI⁺						
(² D _{3/2})	InI	13966-94-4	**	14.97 (V)	PE	4713
(² D _{5/2})			**	15.78 (V)	PE	4713
(² D _{3/2})			**	17.61 (V)	PE	4713
(² D _{3/2})			**	18.42 (V)	PE	4713
(² D _{5/2})			**	25.03 (V)	PE	4713
(² D _{3/2})			**	25.06 (V)	PE	5035
(² D _{5/2})			**	25.17 (V)	PE	4713
(² Σ _{1/2})			**	25.86 (V)	PE	4713
(² D _{3/2})			**	25.95 (V)	PE	5035
(² D _{5/2})			**	25.98 (V)	PE	4713
(² D _{3/2})			**	26.16 (V)	PE	4713
InI₃⁺						
	InI ₃	13510-35-5	**	9.14	PE	4215
			**	~9.58 (V)	PE	4398
SnI₁⁺						
	SnI ₁	7790-47-8	**	9.45 (V)	PE	5148
C₁₃H₁₉MoSnI⁺						
	(C ₇ H ₅) ₂ (Sn(CH ₃) ₃)MoI (Molybdenum,bis(η ⁻ -2,4-cyclopentadien-1-yl)iodo(trimethylstannyl)-)	51249-26-4	**	6.51±0.09	EI	5321
SbI₃⁺						
	SbI ₃	7790-44-5	**	9.05 (V)	PE	5473
			**	9.06 (V)	PE	4146
C₁H₃TeI⁺						
	C ₁ H ₃ TeI (Tellurophene, 2-iodo-)	59163-68-7	**	8.34±0.05 (V) *	PE	4626
Xe⁺						
(² P _{3/2})	Xe	7440-63-3	**	12.127±0.002	PE	3525
(² P _{1/2})			**	13.434±0.002	PE	3525
(² P _{1/2})			**	13.435	PE	4670
(² P _{3/2})			**	12.125±0.004	PEN	3541
			**	12.12±0.02	EI	5342
(² P _{3/2})			**	12.130	PE	4670
Xe⁺²						
	Xe	7440-63-3	**	33.5±0.2	EI	4503
Xe₂⁺						
	Xe ₂	12185-19-2	**	11.7 (V)	PE	4670
			**	11.13	PI	4930
(1/2)u			**	11.85±0.015 (V)	PE	4749
(3/2)g			**	12.02±0.015 (V)	PE	4749
(1/2)g			**	12.21±0.015 (V)	PE	4749
(1/2)u			**	13.31±0.015 (V)	PE	4749
			**	11.75±0.3	EI	5350
F₂Xe⁺						
	XeF ₂	13709-36-9	**	12.4 (V)	S	5182
F₁Xe⁺						
	XeF ₁	13709-61-0	**	13.1 (V)	S	5182
F₆Xe⁺						
	XeF ₆	13693-09-9	**	12.35 (V)	S	5182

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
OF_iXe⁺						
	XeOF _i	13774-85-1	**	≥ 12.0	PE	3943
ArXe⁺						
	XeAr	58206-67-0	**	11.985±0.017	PI	4926
KrXe⁺						
	XeKr	12521-42-5	**	11.757±0.017	PI	4926
			**	12.2±0.2	EI	5350
Cs⁺						
	Cs	7440-46-2	**	3.89	PE	4642
			**	3.89	EI	4352
	CsOH	21351-79-1	OH	~ 10	EI	3461
	CsNO ₃	XXXXXX-XX-X		10.50±0.5	EI	4100
(² P _{3/2})	CsCl	7647-17-8	Cl ⁻	17.46±0.04 (V)	PE	5035
(² P _{1/2})				18.86±0.04 (V)	PE	5035
(² P _{3/2})	CsBr	7787-69-1	Br ⁻	17.52±0.04 (V)	PE	5035
(² P _{1/2})				18.53±0.04 (V)	PE	5035
(² P _{3/2})	CsI	7789-17-5	I ⁻	17.60±0.04 (V)	PE	5035
(² P _{1/2})				19.31±0.04 (V)	PE	5035
Cs²⁺						
	Cs ⁺	18459-37-5	**	23.14±0.02	S	5179
Cs₂⁺						
	Cs ₂	12184-83-7	**	3.60-3.71	PI	3772
Cs₂O⁺						
	Cs ₂ MoO ₄	XXXXXX-XX-X	MoO ₃	~ 12.	EI	4578
NO₃Cs⁺						
	CsNO ₃	XXXXXX-XX-X	**	8.78±0.06 (V)	PE	5354
Cs₂NO₃⁺						
	(CsNO ₃) ₂	XXXXXX-XX-X		14.1±1.0	EI	4100
FCs⁺						
	CsF	13400-13-0	**	8.80±0.10	PE	3958
			**	9.0±0.2	PE	4606
(² Π)			**	9.68±0.05 (V)	PE	4353
			**	9.7 (V)	PE	4307
(² Σ)			**	10.22±0.05 (V)	PE	4353
F₄AlCs⁺						
	CsAlF ₄	39211-00-2	**	13.12±0.05 (V)	PE	5238
O₃PCs⁺						
	CsPO ₃	XXXXXX-XX-X	**	9.41±0.04 (V)	PE	4840
ClCs⁺						
	CsCl	7647-17-8	**	7.84±0.05	PE	3958
			**	7.9±0.2	PE	4606
(² P _{3/2})			**	8.32±0.1	PE	4344
(² P _{3/2})			**	8.32±0.1	PE	5035
			**	8.5 (V)	PE	4307
(² Π _{3/2})			**	8.7±0.1 (V)	PE	4353
			**	8.83±0.05 (V)	PE	4266
(² Π _{1/2})			**	8.9±0.1 (V)	PE	4353
(² Σ)			**	9.48±0.05 (V)	PE	4353

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
Cl_2Cs_2^+	$(\text{CsCl})_2$	12258-95-6	**	9.15 (V)	PE	5035
			**	9.15 (V)	PE	4344
AlCl_4Cs^+	CsAlCl_4	17992-03-9	**	10.50 ± 0.05 (V)	PE	5238
BrCs^+	CsBr	7787-69-1	**	7.3 ± 0.2	PE	4606
			**	7.46 ± 0.05	PE	3958
			**	7.74 ± 0.1	PE	4344
			**	7.74 ± 0.1	PE	5035
			**	8.0 (V)	PE	4307
			**	8.47 ± 0.5 (V)	PE	4353
			**	8.57 ± 0.04 (V)	PE	5035
			**	8.88 ± 0.05 (V)	PE	4353
			**	9.21 ± 0.05 (V)	PE	4353
$\text{O}_3\text{MoCs}_2^+$	Cs_2MoO_4	XXXXXX-XX-X O		$\sim 12.$	EI	4578
$\text{O}_4\text{MoCs}_2^+$	Cs_2MoO_4	XXXXXX-XX-X	**	7.	EI	4578
ICs^+	CsI	7789-17-5	**	6.5 ± 0.2	PE	4606
			**	7.10 ± 0.05	PE	3958
			**	7.10 ± 0.1	PE	4344
			**	7.10 ± 0.1	PE	5035
			**	7.2 (V)	PE	4307
			**	7.46 ± 0.05 (V)	PE	4353
			**	8.00 ± 0.10	PE	3958
			**	8.12 ± 0.05 (V)	PE	4353
			**	8.40 ± 0.04 (V)	PE	5035
			**	8.46 ± 0.05 (V)	PE	4353
Ba^+	Ba	7440-39-3	**	5.1 ± 0.2	EI	4458
			**	5.0	PE	4860
			**	5.22 ± 0.03	PE	4381
			**	5.0 ± 0.3	EI	5067
			**	5.15 ± 0.1	EI	4114
			**	5.17 ± 0.08	EI	5342
			**	~ 5.2	EI	3486
				10.95 ± 0.18	EI	3821
	BaO	1304-28-5	O			
Ba^{+2}	Ba	7440-39-3	**	12	EI	3486
OBa^+	BaO	1304-28-5	**	6.5 ± 0.2	EI	4458
			**	6.85 ± 0.1	EI	5275
			**	6.97 ± 0.12	EI	3821
			**	$7. \pm 1$	EI	4506
BO_2Ba^+	BaBO_2	54597-36-3	**	10.8 ± 0.2	EI	5585
ClBa^+	BaCl	14832-99-6	**	5.0	PE	4860

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
Cl_2Ba^+	BaCl_2	10361-37-2	**	10.0 (V)	PE	4761
BrBa^+	BaBr	14832-97-4	**	5.0	PE	4860
BaI^+	BaI	12524-20-8	**	5.0 ± 0.3	EI	5067
	BaI_2	13718-50-8	**	9.0 ± 0.3	EI	5067
I_2Ba^+	BaI_2	13718-50-8	**	9.7 (V)	PE	4761
La^+	La	7439-91-0	**	5.45 ± 0.2	EI	4114
			**	5.5 ± 0.7	EI	5303
			**	5.51 ± 0.09	EI	5342
			**	5.6 ± 0.1	EI	4560
			**	6.9 ± 1.2	EI	3978
	LaF_3	13709-38-1		26	EI	3456
				26.9	EI	3466
CLa^+	LaC_2	12071-15-7	C	14.9 ± 0.5	EI	3457
C_2La^+	LaC_2	12071-15-7	**	5.4 ± 0.3	EI	3457
C_3La^+	LaC_3	12602-63-0	**	6.8 ± 0.5	EI	3457
C_1La^+	LaC_1	12603-31-5	**	4.7 ± 0.5	EI	3457
$\text{C}_5\text{H}_5\text{La}^+$	(C ₅ H ₅) ₃ La (Lanthanum, tris[(1,2,3,4,5-η)-2,4-cyclopentadien-1-yl]-)	1272-23-7	2C ₅ H ₅	17.3 ± 0.3	EI	5490
$\text{C}_8\text{H}_8\text{La}^+$	(iso-C ₅ H ₇ -C ₅ H ₁₁) ₃ La (Lanthanum, tris[(1,2,3,4,5-η)-1-(1-methylethyl)-2,4-cyclopentadien-1-yl]-)	68959-87-5		22.5 ± 0.3	EI	5490
$\text{C}_{10}\text{H}_{10}\text{La}^+$	(C ₅ H ₅) ₃ La (Lanthanum, tris[(1,2,3,4,5-η)-2,4-cyclopentadien-1-yl]-)	1272-23-7	C ₅ H ₅	10.2 ± 0.3	EI	5490
$\text{C}_{15}\text{H}_{15}\text{La}^+$	(C ₅ H ₅) ₃ La (Lanthanum, tris[(1,2,3,4,5-η)-2,4-cyclopentadien-1-yl]-)	1272-23-7	**	7.9 ± 0.3	EI	5490
$\text{C}_{16}\text{H}_{22}\text{La}^+$	(iso-C ₅ H ₇ -C ₅ H ₁₁) ₃ La (Lanthanum, tris[(1,2,3,4,5-η)-1-(1-methylethyl)-2,4-cyclopentadien-1-yl]-)	68959-87-5	C ₃ H ₇ -C ₅ H ₃	13.8 ± 0.3	EI	5490
$\text{C}_{21}\text{H}_{33}\text{La}^+$	(iso-C ₅ H ₇ -C ₅ H ₁₁) ₃ La (Lanthanum, tris[(1,2,3,4,5-η)-1-(1-methylethyl)-2,4-cyclopentadien-1-yl]-)	68959-87-5	**	8.0 ± 0.3	EI	5490
OLa^+	LaO	12031-20-8	**	4.90 ± 0.1	EI	4560
			**	4.95 ± 0.1	EI	4114
			**	5.2	EI	4119

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
FLa⁺	LaF ₃	13709-38-1		16	EI	3456
				18.5	EI	3466
F₂La⁺	LaF ₃	13709-38-1		9	EI	3456
				11.8	EI	3466
F₅La₂⁺	(LaF ₃) ₂	12592-31-3		12.4	EI	3466
RhLa⁺	LaRh	12142-68-6	**	7.7±1.0	EI	3978
Ce⁺	Ce	7440-45-1	**	5.5387±0.0004	S	5056
				5.5387±0.0004	S	5186
				5.537±0.0004	PI	5056
				5.44±0.1	EI	4624
				5.6±0.5	EI	3969
				5.7±0.3	EI	3597
				5.9±0.4	EI	3468
				5.9±0.6	EI	3621
				6.0±0.5	EI	3473
				6.0±0.5	EI	3986
	CeO	12014-74-3		~13.5	EI	4061
	CeF ₃	7758-88-5		25.2	EI	3607
	CeI ₃	7790-87-6		16.75±0.15	EI	4607
			3I			
Ce₂⁺	Ce ₂	12595-88-9	**	5.9±0.4	EI	3471
C₂Ce⁺	C ₂ Ce	12012-32-7	**	5.6±0.4	EI	3597
				6.2±0.5	EI	3969
NCe⁺	CeN	25764-08-3	**	5.8±0.6	EI	3469
OCe⁺	CeO	12014-74-3	**	4.90±0.1	EI	4624
				5.2±0.2	EI	4061
				5.3±0.5	EI	3986
				6.0±0.5	EI	3473
	CeO ₂	1306-38-3		~11	EI	4061
O₂Ce⁺	CeO ₂	1306-38-3	**	9.7±0.5	EI	3986
				10.3±0.2	EI	4061
O₂Ce₂⁺	(CeO) ₂	12258-89-8	**	8±1	EI	3986
FCe⁺	CeF ₃	7758-88-5		17.2	EI	3607
F₂Ce⁺	CeF ₃	7758-88-5		13.5	EI	3607
F₃Ce⁺	CeF ₃	7758-88-5	**	11.4	EI	3607

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
F_5Ce^+	Ce_2F_{11}	37346-47-7		13.1	EI	3607
CSiCe^+	CSiCe	51257-45-5	**	~9	EI	3969
SCe^+	CeS	12014-82-3	**	6.0 ± 0.6	EI	3621
S_2Ce^+	CeS_2	12133-58-3	**	13.5 ± 1	EI	3621
CRuCe^+	RuCeC	70378-92-6	**	6.5 ± 1	EI	5331
C_2RuCe^+	RuCeC_2	XXXXX-XX-X	**	7.5 ± 0.8	EI	5331
RhCe^+	CeRh	12157-69-6	**	6.8 ± 1.0	EI	4209
CRhCe^+	RhCeC	70378-91-5	**	$6. \pm 1$	EI	5331
C_2RhCe^+	RhCeC_2	53262-56-9	**	7.6 ± 0.8	EI	5331
PdCe^+	CePd	12292-14-7	**	6.2 ± 0.5	EI	3597
ICe^+	CeI_3	7790-87-6	$\text{I}_2?$	13.15 ± 0.15	EI	4607
			2I	13.6 ± 0.5	EI	3820
ICe^{+2}	CeI_3	7790-87-6		28 ± 1	EI	3820
I_2Ce^+	CeI_3	7790-87-6	I	9.55 ± 0.1	EI	4607
			I	9.7 ± 0.5	EI	3820
I_3Ce^+	CeI_3	7790-87-6	**	9.05 ± 0.1	EI	4607
			**	9.6 ± 0.5	EI	3820
Pr^+	Pr	7440-10-0	**	5.464 ± 0.006	PI	5056
			**	5.464	PI	5186
			**	5.37 ± 0.1	EI	4624
	PrI_3	13813-23-5	3I	17.0 ± 0.2	EI	3820
$\text{C}_5\text{H}_5\text{Pr}^+$	(C ₅ H ₅) ₃ Pr (Praseodymium, tris[(1,2,3,4,5-η)-2,4-cyclopentadien-1-yl]-)	11077-59-1	2C ₅ H ₅	17.0 ± 0.4	EI	5490
$\text{C}_8\text{H}_8\text{Pr}^+$	(iso-C ₅ H ₅ -C ₃ H ₃) ₂ Pr (Praseodymium, tris[(1,2,3,4,5-η)-1-(1-methylethyl)-2,4-cyclopentadien-1-yl]-)	69021-86-9		22.1 ± 0.3	EI	5490
$\text{C}_{10}\text{H}_{10}\text{Pr}^+$	(C ₅ H ₅) ₂ Pr (Praseodymium, tris[(1,2,3,4,5-η)-2,4-cyclopentadien-1-yl]-)	11077-59-1	C ₅ H ₅	10.0 ± 0.2	EI	5490

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{15}H_{15}Pr^+$	$(C_5H_5)_3Pr$ (Praseodymium, tris[(1,2,3,4,5- η)-2,4-cyclopentadien-1-yl]-)	11077-59-1	**	8.2 ± 0.2	EI	5490
$C_{16}H_{22}Pr^+$	$(iso-C_3H_7C_5H_5)_3Pr$ (Praseodymium, tris[(1,2,3,4,5- η)-1-(1-methylethyl)-2,4-cyclopentadien-1-yl]-)	69021-86-9	$C_3H_7C_5H_5$	12.4 ± 0.3	EI	5490
$C_{21}H_{33}Pr^+$	$(iso-C_3H_7C_5H_5)_3Pr$ (Praseodymium, tris[(1,2,3,4,5- η)-1-(1-methylethyl)-2,4-cyclopentadien-1-yl]-)	69021-86-9	**	8.2 ± 0.3	EI	5490
$CNPr^+$	PrCN	57137-34-5	**	5.5 ± 0.5	EI	4505
OPr^+	PrO	12035-81-3	**	4.90 ± 0.1	EI	4624
IPr^+	PrI ₃	13813-23-5	2I	12.9 ± 0.2	EI	3820
I_2Pr^+	PrI ₃	13813-23-5	I	10.0 ± 0.2	EI	3820
I_3Pr^+	PrI ₃	13813-23-5	**	9.2 ± 0.2	EI	3820
Nd^+	Nd	7440-00-8	**	5.5250 ± 0.0006	S	5056
			**	5.5250 ± 0.0006	S	5186
			**	5.523 ± 0.003	PI	5056
			**	5.49 ± 0.1	EI	4624
			**	6.5	EI	4030
	NdCl ₃	10024-93-8	3Cl?	20.9 ± 1.0	EI	3802
	NdBr ₃	13536-80-6		16.9 ± 0.7	EI	3976
	NdI ₃	13813-24-6	3I	15.9 ± 0.2	EI	3820
$C_3H_5Nd^+$	$(C_5H_5)_3Nd$ (Neodymium, tris[(1,2,3,4,5- η)-2,4-cyclopentadien-1-yl]-)	1273-98-9	$2C_3H_5$	16.8 ± 0.2	EI	5490
$C_8H_8Nd^+$	$(iso-C_3H_7C_5H_5)_3Nd$ (Neodymium, tris[(1,2,3,4,5- η)-1-(1-methylethyl)-2,4-cyclopentadien-1-yl]-)	69021-85-8		18.9 ± 0.3	EI	5490
$C_{10}H_{10}Nd^+$	$(C_5H_5)_3Nd$ (Neodymium, tris[(1,2,3,4,5- η)-2,4-cyclopentadien-1-yl]-)	1273-98-9	C_5H_5	9.8 ± 0.2	EI	5490
$C_{15}H_{15}Nd^+$	$(C_5H_5)_3Nd$ (Neodymium, tris[(1,2,3,4,5- η)-2,4-cyclopentadien-1-yl]-)	1273-98-9	**	8.0 ± 0.2	EI	5490
$C_{16}H_{22}Nd^+$	$(iso-C_3H_7C_5H_5)_3Nd$ (Neodymium, tris[(1,2,3,4,5- η)-1-(1-methylethyl)-2,4-cyclopentadien-1-yl]-)	69021-85-8	$C_3H_7C_5H_5$	10.8 ± 0.3	EI	5490
$C_{21}H_{33}Nd^+$	$(iso-C_3H_7C_5H_5)_3Nd$ (Neodymium, tris[(1,2,3,4,5- η)-1-(1-methylethyl)-2,4-cyclopentadien-1-yl]-)	69021-85-8	**	7.9 ± 0.3	EI	5490

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
ONd⁺	NdO	12035-20-0	**	4.97±0.1	EI	4624
ClNd⁺	NdCl ₃	10024-93-8	2Cl?	17.3±1.0	EI	3802
Cl₂Nd⁺	NdCl ₃	10024-93-8	Cl?	11.9±0.3	EI	3802
Cl₃Nd⁺	NdCl ₃	10024-93-8	**	<11.4	EI	3802
Br₂Nd⁺	NdBr ₃	13536-80-6		10.5±0.7	EI	3976
INd⁺	NdI ₃	13813-24-6	2I	13.6±0.5	EI	3820
I₂Nd⁺	NdI ₃	13813-24-6	I	9.3±0.5	EI	3820
I₃Nd⁺	NdI ₃	13813-24-6	**	9.2±0.5	EI	3820
Pm⁺	Pm	7440-12-2	** **	5.582±0.01 5.582±0.010	OTH OTH	5056 5186
Sm⁺	Sm	7440-19-9	** ** ** ** **	5.6437±0.0006 5.6437±0.001 5.639±0.003 5.5 5.58±0.1	S S PI EI EI	5186 5056 5056 4872 4624
	SmI ₂	32248-43-4	2I	12.5 13.1±0.2	EI EI	3820 4122
OSm⁺	SmO	12035-88-0	** **	5.5 5.55±0.1	EI EI	4872 4624
ISm⁺	SmI ₂	32248-43-4	I	9.2 9.8±0.2	EI EI	3820 4122
I₂Sm⁺	SmI ₂	32248-43-4	** **	8.7 9.0±0.2	EI EI	3820 4122
Eu⁺	Eu	7440-53-1	** ** ** ** ** ** ** ** **	5.6704±0.0003 5.6704±0.0003 5.67045±0.00002 5.666±0.003 5.5 5.6±0.5 5.68±0.1 5.9±0.2 6.1±0.5	S S S PI EI EI EI EI EI	5056 5186 5511 5056 4872 3611 4624 3459 4869
	EuI ₂	22015-35-6		12.45±0.2	EI	3612

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
Eu^{+2}	Eu^+	15065-79-9	**	11.241 ± 0.006	S	4210
Eu_2^+	Eu_2	12596-00-8	**	6.3 ± 1.0	EI	4012
C_2Eu^+	EuC_2	12127-44-5	**	6.6 ± 0.7	EI	3611
CNEu^+	EuCN	50647-38-6	**	5.5 ± 1.5	EI	3798
OEu^+	EuO	12020-60-9	** ** ** **	6.2 6.3 ± 0.2 6.3 ± 0.8 6.48 ± 0.1	EI EI EI EI	4872 5468 4869 4624
OEu_2^+	Eu_2O	62462-47-9	**	6.1 ± 0.9	EI	4869
O_2Eu_2^+	Eu_2O_2	62462-48-0	**	7.4 ± 1.0	EI	4869
SEu^+	EuS	12020-65-4	** **	6.8 ± 0.3 6.8 ± 0.3	EI EI	4486 4874
S_2Eu^+	EuS_2	55957-42-1	** **	7.2 ± 0.5 7.2 ± 0.5	EI EI	4486 4874
SEu_2^+	Eu_2S	62462-49-1	** **	6.7 ± 0.5 6.7 ± 0.5	EI EI	4486 4874
S_2Eu_2^+	Eu_2S_2	62462-51-5	** **	6.6 ± 0.5 6.6 ± 0.5	EI EI	4486 4874
AgEu^+	EuAg	12249-50-2	**	6.1 ± 0.5	EI	4012
IEu^+	EuI_2	22015-35-6		9.90 ± 0.2	EI	3612
I_2Eu^+	EuI_2	22015-35-6	**	8.85 ± 0.2	EI	3612
Gd^+	Gd	7440-54-2	** ** ** ** **	6.1502 ± 0.0006 6.1502 ± 0.0006 6.1 ± 0.6 6.24 ± 0.1 6.3 ± 0.6	S S EI EI EI	5056 5186 4902 4624 4869
	GdCl_3	10138-52-0	3Cl?	20.9 ± 1.0	EI	3802
	GdI_3	13572-98-0	3I	17.0 ± 0.2	EI	3820
OGd^+	GdO	12024-77-0	** **	5.75 ± 0.1 6.5 ± 0.8	EI EI	4624 4869

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
O_2Gd^+	GdO_2	53789-25-6	**	9.5 ± 1.0	EI	4869
OGd_2^+	Gd_2O	62462-54-8	**	6.5 ± 1.0	EI	4869
O_2Gd_2^+	Gd_2O_2	62462-55-9	**	8.2 ± 1.0	EI	4869
SGd^+	GdS	12134-74-6	**	6.9 ± 0.6	EI	4902
ClGd^+	GdCl_1	10138-52-0	2Cl?	16.5 ± 1.0	EI	3802
Cl_2Gd^+	GdCl_1	10138-52-0	Cl?	11.9 ± 0.3	EI	3802
NaCl_3Gd^+	NaGdCl_1	XXXXXX-XX-X		10.1 ± 0.5	EI	3802
IGd^+	GdI_3	13572-98-0	2I	13.5 ± 0.2	EI	3820
I_2Gd^+	GdI_3	13572-98-0	I	10.1 ± 0.2	EI	3820
I_3Gd^+	GdI_3	13572-98-0	**	9.2 ± 0.2	EI	3820
Tb^+	Tb	7440-27-9	**	5.8639 ± 0.0006	S	5056
			**	5.8639 ± 0.0006	S	5186
			**	5.84 ± 0.1	EI	4624
	TbI_3	13813-40-6	3I	17.6 ± 0.2	EI	3820
OTb^+	TbO	12035-91-5	**	5.62 ± 0.1	EI	4624
			**	6.1 ± 0.7	EI	4869
OTb_2^+	Tb_2O	62462-71-9	**	6.6 ± 0.8	EI	4869
O_2Tb_2^+	Tb_2O_2	62462-78-6	**	6.0 ± 0.8	EI	4869
CuTb^+	TbCu	12019-22-6	**	5.3 ± 0.3	EI	5296
ITb^+	TbI_3	13813-40-6	2I	13.7 ± 0.2	EI	3820
I_2Tb^+	TbI_3	13813-40-6	I	10.5 ± 0.2	EI	3820
I_3Tb^+	TbI_3	13813-40-6	**	9.5 ± 0.2	EI	3820
Dy^+	Dy	7429-91-6	**	5.9390 ± 0.0006	S	5056
			**	5.9390 ± 0.0006	S	5186
			**	5.936 ± 0.003	PI	5056
			**	5.90 ± 0.1	EI	4624

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
Dy⁺	DyI ₃	15474-63-2	3I	16.4±0.2	EI	3820
ODy⁺	DyO	12175-28-9	**	6.08±0.1	EI	4624
CuDy⁺	DyCu	12018-73-4	**	5.4±0.4	EI	5296
IDy⁺	DyI ₃	15474-63-2	2I	13.1±0.2	EI	3820
I₂Dy⁺	DyI ₃	15474-63-2	I	10.5±0.2	EI	3820
I₃Dy⁺	DyI ₃	15474-63-2	**	9.6±0.2	EI	3820
Ho⁺	Ho	7440-60-0	**	6.0216±0.0006	S	5056
			**	6.0216±0.0006	S	5186
			**	6.017±0.003	PI	5056
			**	5.8±0.2	EI	3440
			**	5.99±0.1	EI	4624
			**	6.1±0.6	EI	4869
	HoI ₃	13813-41-7	3I	16.7±0.2	EI	3820
Ho₂⁺	Ho ₂	12596-28-0	**	6.0±1.0	EI	3440
OHo⁺	HoO	12281-10-6	**	6.17±0.1	EI	4624
			**	6.2±0.7	EI	4869
OHo₂⁺	Ho ₂ O	62462-59-3	**	6.2±0.7	EI	4869
O₂Ho₂⁺	Ho ₂ O ₂	62462-60-6	**	7.5±0.1	EI	4869
CuHo⁺	HoCu	12018-93-8	**	5.3±0.3	EI	5296
AgHo⁺	HoAg	12002-74-3	**	5.7±0.6	EI	3440
IHo⁺	HoI ₃	13813-41-7	2I	13.2±0.2	EI	3820
I₂Ho⁺	HoI ₃	13813-41-7	I	10.4±0.2	EI	3820
I₃Ho⁺	HoI ₃	13813-41-7	**	9.2±0.2	EI	3820
Er⁺	Er	7440-52-0	**	6.1077±0.0006	S	5056
			**	6.1077±0.0010	S	5186
			**	6.104±0.003	PI	5056
			**	5.93±0.1	EI	4624
	ErI ₃	13813-42-8	3I	16.2±0.2	EI	3820

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
OEr⁺	ErO	12280-61-4	**	6.30±0.1	EI	4624
IEr⁺	ErI ₃	13813-42-8	2I	13.3±0.2	EI	3820
I₂Er⁺	ErI ₃	13813-42-8	I	10.2±0.2	EI	3820
I₃Er⁺	ErI ₃	13813-42-8	**	9.0±0.2	EI	3820
Tm⁺	Tm	7440-30-4	**	5.7	EI	3460
			**	6.11±0.1	EI	4624
	TmBr ₃	14456-51-0		17.5±0.7	EI	3976
	TmI ₃	13813-43-9	3I	16.1±0.2	EI	4122
OTm⁺	TmO	12281-29-7	**	6.44±0.1	EI	4624
Br₂Tm⁺	TmBr ₃	14456-51-0		11.1±0.7	EI	3976
Br₃Tm⁺	TmBr ₃	14456-51-0	**	9.6±0.7	EI	3976
ITm⁺	TmI ₃	13813-43-9	2I	12.4±0.2	EI	4122
I₂Tm⁺	TmI ₃	13813-43-9	I	10.5±0.2	EI	4122
I₃Tm⁺	TmI ₃	13813-43-9	**	9.2±0.2	EI	4122
Yb⁺	Yb	7440-64-4	**	6.21±0.1	EI	4624
			**	6.3±0.3	EI	4105
	YbCl ₂	13874-77-6		15.05±0.26	EI	3614
	YbBr ₃ ?	13759-89-2		14.7±0.7	EI	3976
Yb⁺²	Yb ⁺	20205-78-1	**	12.184±0.006	S	3974
Yb₂⁺	Yb ₂	12771-79-8	**	4-5	EI	4105
OYb⁺	YbO	25578-79-4	**	6.55±0.1	EI	4624
ClYb⁺	YbCl ₂	13874-77-6		10.70±0.21	EI	3614
Cl₂Yb⁺	YbCl ₂	13874-77-6	**	9.73±0.21	EI	3614
BrYb⁺	YbBr ₂ ?	25502-05-0		10.0±0.7	EI	3976
Br₂Yb⁺	YbBr ₃ ?	13759-89-2		10.0±0.7	EI	3976

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
Lu⁺	Lu	7439-94-3	**	5.425889±0.00001 S		4060
			**	5.2±0.5	EI	4869
			**	5.28±0.1	EI	4624
			**	5.3±0.3	EI	3618
C₂Lu⁺	LuC ₂	12175-89-2	**	7.8±1	EI	3618
C₁Lu⁺	LuC ₁	37215-84-2	**	11.1±1	EI	3618
OLu⁺	LuO	12032-02-9	**	6.79±0.1	EI	4624
			**	7.8±0.6	EI	4869
OLu₂⁺	Lu ₂ O	12339-78-5	**	6.5±0.7	EI	4869
Hf⁺	Hf	7440-58-6	**	6.65±0.1	EI	4114
			**	6.65±0.10	EI	5342
H₁₆B₁Hf⁺	Hf(BH ₃) ₁	37274-93-4	**	11.6±0.1 (V)	PE	4825
	Hf(BH ₃) ₁	53608-70-1	**	11.6±0.1 (V)	PE	4888
C₂₀H₁₁Hf⁺	((CH ₃) ₃ CCH ₂) ₁ Hf	50654-35-8	**	8.51±0.1 (V)	PE	4242
NHf⁺	HfN	25817-87-2	**	<10	EI	4207
C₈H₂₁N₁Hf⁺	(N(CH ₃) ₂) ₁ Hf	XXXXX-XX-X	**	7.50 (V)	PE	4588
C₁₆H₁₀N₁Hf⁺	(N(C ₂ H ₅) ₂) ₁ Hf	XXXXX-XX-X	**	7.15 (V)	PE	4588
OHf⁺	HfO	12029-22-0	**	7.55±0.1	EI	4114
O₂Hf⁺	HfO ₂	12055-23-1	**	9.35±0.2	EI	4114
C₁₆H₁₁Si₁Hf⁺	((CH ₃) ₃ SiCH ₂) ₁ Hf	40334-04-1	**	8.58±0.1 (V)	PE	4242
Cl₁Hf⁺	HfCl ₁	13499-05-3	**	12.03 (V)	PE	4694
C₁₀H₁₀Cl₂Hf⁺	(η-C ₅ H ₅) ₂ HfCl ₂	12116-66-4	**	8.9±0.1 (V)	PE	4987
	(Hafnium,dichlorobis(η ³ -2,4-cyclopentadien-1-yl)-)		**	8.87±0.05 (V)	PE	4375
Br₁Hf⁺	HfBr ₁	13777-22-5	**	11.06 (V)	PE	4694
	(JC-Mean value of Jahn-Teller components)					
I₁Hf⁺	HfI ₁	13777-23-6	**	9.53 (V)	PE	4694
	(JC-Mean value of Jahn-Teller components)					

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
Ta^+	Ta	7440-25-7	**	7.31 ± 0.09	EI	5342
$\text{C}_3\text{H}_{15}\text{Ta}^+$	$(\text{CH}_3)_5\text{Ta}$	53378-72-6	**	8.83 ± 0.02 (V)	PE	4733
$\text{C}_{10}\text{H}_{13}\text{Ta}^+$	$(\text{C}_5\text{H}_5)_2\text{H}_2\text{Ta}$ (Tantalum, bis(η^5 -2,4-cyclopentadien-1-yl)dihydro-)	54474-28-1	**	8.1 ± 0.1 (V)	PE	4425
$\text{C}_{10}\text{H}_{30}\text{N}_5\text{Ta}^+$	$(\text{N}(\text{CH}_3)_2)_5\text{Ta}$	XXXXX-XX-X	**	6.89 (V)	PE	5036
OTa^+	TaO	12035-90-4	**	7.5 ± 0.5	EI	4678
			**	7.92 ± 0.1	EI	4624
O_2Ta^+	TaO ₂	12036-14-5	**	8.5 ± 0.5	EI	4678
Cl_2Ta^+	TaCl ₅	7721-01-9		20.3	EI	3783
Cl_3Ta^+	TaCl ₅	7721-01-9		15.2	EI	3783
Cl_4Ta^+	TaCl ₅	7721-01-9		10.9	EI	3783
Cl_5Ta^+	TaCl ₅	7721-01-9	**	11.08 (s)	PE	4764
$\text{C}_{10}\text{H}_{10}\text{Cl}_2\text{Ta}^+$	$(\eta\text{-C}_5\text{H}_5)_2\text{TaCl}_2$ (Tantalum, dichlorobis(η^5 -2,4-cyclopentadien-1-yl)-)	54039-37-1	**	6.4 ± 0.1 (V)	PE	4987
$\text{C}_{10}\text{H}_{10}\text{Br}_2\text{Ta}^+$	$(\eta\text{-C}_5\text{H}_5)_2\text{TaBr}_2$ (Tantalum, dibromobis(η^5 -2,4-cyclopentadien-1-yl)-)	69005-97-6	**	6.4 ± 0.1 (V)	PE	4987
$\text{C}_{13}\text{H}_{21}\text{SnTa}^+$	$(\text{C}_5\text{H}_5)_2(\text{Sn}(\text{CH}_3)_2)\text{TaH}_2$ (Tantalum, bis(η^5 -2,4-cyclopentadien-1-yl)dihydro(trimethylstannyl)-)	51192-04-2	**	6.77 ± 0.12	EI	5321
W^+	W	7440-33-7	**	7.49 ± 0.08	EI	5342
	(CO) ₆ W	14040-11-0	6CO	21.01 ± 0.05	EI	5291
	CS(CO) ₅ W	50358-92-4	5CO + CS	21.97 ± 0.13	EI	5291
	WBr ₄	14055-81-3	Br	23.1 ± 0.3	EI	4906
	WBr ₅	13470-11-6	5Br	25.0 ± 0.3	EI	4906
$\text{C}_3\text{H}_3\text{W}^+$	$\text{C}_5\text{H}_5(\text{CO})_3\text{W}$ (Tungsten, tricarbonyl(η^5 -2,4-cyclopentadien-1-yl)-)	12079-77-5	3CO + C ₂ H ₂	20.1 ± 1.0	EI	4598
$\text{C}_5\text{H}_5\text{W}^+$	$\text{C}_5\text{H}_5(\text{CO})_3\text{W}$ (Tungsten, tricarbonyl(η^5 -2,4-cyclopentadien-1-yl)-)	12079-77-5	3CO	14.5 ± 0.5	EI	4598
$\text{C}_6\text{H}_{18}\text{W}^+$	$(\text{CH}_3)_6\text{W}$	36133-73-0	**	8.59 ± 0.02 (V)	PE	4733

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{10}H_{12}W^+$	(C ₅ H ₅) ₂ H ₂ W (Tungsten, bis(η^5 -2,4-cyclopentadien-1-yl)dihydro-)	1271-33-6	**	6.4±0.1 (V)	PE	4425
			**	6.35±0.2	OTH	5278
$C_{12}H_{11}W^+$	(C ₅ H ₅) ₂ (η -CH ₂ =CH ₂)W (Tungsten, bis(η^5 -2,4-cyclopentadien-1-yl)(η^5 -ethene)-)	37343-06-9	**	6.0±0.1 (V)	PE	4425
$C_{12}H_{16}W^+$	(C ₅ H ₅) ₂ (CH ₃) ₂ W (Tungsten, bis(η^5 -2,4-cyclopentadien-1-yl)dimethyl-)	39333-53-4	**	6.0±0.1 (V)	PE	4425
$C_{13}H_{16}W^+$	(C ₅ H ₅) ₂ (η -CH ₂ =CHCH ₃)W (Tungsten, bis(η^5 -2,4-cyclopentadien-1-yl)(1,2- η)-1-propene)-)	37343-23-0	**	5.9±0.1 (V)	PE	4425
$C_6H_6W_2^+$	[C ₅ H ₅ (CO) ₃ W] ₂ (Tungsten, hexacarbonylbis (η^5 -2,4-cyclopentadien-1-yl)di-)	12566-66-4		29.0±1.0	EI	4598
$C_8H_8W_2^+$	[C ₅ H ₅ (CO) ₃ W] ₂ (Tungsten, hexacarbonylbis (η^5 -2,4-cyclopentadien-1-yl)di-)	12566-66-4		25.0±1.0	EI	4598
$C_{10}H_{10}W_2^+$	[C ₅ H ₅ (CO) ₃ W] ₂ (Tungsten, hexacarbonylbis (η^5 -2,4-cyclopentadien-1-yl)di-)	12566-66-4	6CO	15.5±0.5	EI	4598
$C_{12}H_{36}N_6W^+$	(N(CH ₃) ₂) ₆ W	54935-70-5	**	6.73 (V)	PE	4588
O_2W^+	WO ₂	12036-22-5	**	9.6±0.3	EI	4556
$O_3W_2^+$	W ₂ O ₆	XXXXX-XX-X		35.±1	EI	4131
$O_1W_2^+$	W ₂ O ₆	XXXXX-XX-X		17.1±0.2	EI	4131
$O_3W_2^+$	W ₂ O ₆	XXXXX-XX-X O		15.3±0.2	EI	4131
$O_6W_2^+$	W ₂ O ₆	XXXXX-XX-X **		12.2±0.2	EI	4131
$O_8W_3^+$	W ₃ O ₉	XXXXX-XX-X O		14.6±0.2	EI	4131
$O_9W_3^+$	W ₃ O ₉	XXXXX-XX-X **		12.0±0.2	EI	4131
$O_{11}W_1^+$	W ₁ O ₁₂	XXXXX-XX-X O		13.9±0.2	EI	4131
$W_1O_{12}^+$	W ₁ O ₁₂	XXXXX-XX-X **		12.0±0.2	EI	4131
BO_1W^+	W(BO ₃)O	56644-98-5	**	10.9±0.3	EI	4556

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$\text{B}_2\text{O}_6\text{W}^+$	$\text{B}_2\text{O}_7\text{WO}_3$	XXXXX-XX-X **		12.3 ± 0.3	EI	4556
BO_7W_2^+	$\text{BO}\cdot\text{W}_2\text{O}_6$	XXXXX-XX-X **		12.1 ± 0.3	EI	4556
$\text{BO}_{10}\text{W}_3^+$	$\text{BO}\cdot\text{W}_3\text{O}_9$	XXXXX-XX-X **		12.5 ± 0.3	EI	4556
$\text{B}_2\text{O}_{12}\text{W}_3^+$	$\text{B}_2\text{O}_7\cdot\text{W}_3\text{O}_9$	XXXXX-XX-X **		12.4 ± 0.3	EI	4556
$\text{BO}_{13}\text{W}_4^+$	$\text{BO}\cdot\text{W}_4\text{O}_{12}$	XXXXX-XX-X **		13.1 ± 0.3	EI	4556
COW^+	$(\text{CO})_6\text{W}$	14040-11-0	5CO	18.36 ± 0.06	EI	5291
	$\text{CS}(\text{CO})_5\text{W}$	50358-92-4	4CO + CS	19.48 ± 0.21	EI	5291
$\text{C}_2\text{O}_2\text{W}^+$	$(\text{CO})_6\text{W}$	14040-11-0	4CO	16.29 ± 0.04	EI	5291
	$\text{CS}(\text{CO})_5\text{W}$	50358-92-4	3CO + CS	17.21 ± 0.27	EI	5291
$\text{C}_3\text{O}_3\text{W}^+$	$(\text{CO})_6\text{W}$	14040-11-0	3CO	14.06 ± 0.02	EI	5291
	$\text{CS}(\text{CO})_5\text{W}$	50358-92-4	2CO + CS	14.86 ± 0.11	EI	5291
$\text{C}_4\text{O}_4\text{W}^+$	$(\text{CO})_6\text{W}$	14040-11-0	2CO	12.22 ± 0.03	EI	5291
	$\text{CS}(\text{CO})_5\text{W}$	50358-92-4	CO + CS	13.12 ± 0.11	EI	5291
$\text{C}_5\text{O}_5\text{W}^+$	$(\text{CO})_6\text{W}$	14040-11-0	CO	10.30 ± 0.03	EI	5291
	$\text{CS}(\text{CO})_5\text{W}$	50358-92-4	CS	11.46 ± 0.14	EI	5291
$\text{C}_6\text{O}_6\text{W}^+$	$(\text{CO})_6\text{W}$	14040-11-0	**	8.30 ± 0.02 (V)	PE	3979
			**	8.56 (V)	PE	4456
			**	8.60 ± 0.02	EI	5291
$\text{C}_6\text{H}_5\text{OW}^+$	$\text{C}_5\text{H}_5(\text{CO})_3\text{W}$ (Tungsten, tricarbonyl(η^1 -2,4-cyclopentadien-1-yl)-)	12079-77-5	2CO	13.2 ± 1.0	EI	4598
$\text{C}_7\text{H}_5\text{O}_2\text{W}^+$	$\text{C}_5\text{H}_5(\text{CO})_3\text{W}$ (Tungsten, tricarbonyl(η^1 -2,4-cyclopentadien-1-yl)-)	12079-77-5	CO	12.3 ± 0.2	EI	4598
$\text{C}_8\text{H}_5\text{O}_3\text{W}^+$	$\text{C}_5\text{H}_5(\text{CO})_3\text{W}$ (Tungsten, tricarbonyl(η^1 -2,4-cyclopentadien-1-yl)-)	12079-77-5	**	7.66 ± 0.05	EI	4598
	$[\text{C}_5\text{H}_5(\text{CO})_3\text{W}]_2$ (Tungsten, hexacarbonylbis η^1 -2,4-cyclopentadien-1-yl)di-)	12566-66-4	$\text{C}_5\text{H}_5(\text{CO})_3\text{W}$	10.05 ± 0.2	EI	4598
$\text{C}_{10}\text{H}_8\text{O}_3\text{W}^+$	$\text{C}_7\text{H}_8(\text{CO})_3\text{W}$ (Tungsten, tricarbonyl[(1,2,3,4,5,6- η)-1,3,5-cycloheptatriene]-)	12128-81-3	**	7.32 (V)	PE	5206
			**	7.55 ± 0.05 (V)	PE	4724
$\text{C}_{12}\text{H}_{12}\text{O}_3\text{W}^+$	$(\text{C}_6\text{H}_5(\text{CH}_3)_3)(\text{CO})_3\text{W}$ (Tungsten, tricarbonyl[(1,2,3,4,5,6- η)-1,3,5-trimethylbenzene]-)	12129-69-0	**	7.20 ± 0.05 (V)	PE	4724

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{11}H_{10}OW_2^+$	$[C_5H_5(CO)_3W]_2$ (Tungsten, hexacarbonylbis (η^5 -2,4-cyclopentadien-1-yl)di-)	12566-66-4	5CO	13.85 ± 0.10	EI	4598
$C_{12}H_{10}O_2W_2^+$	$[C_5H_5(CO)_3W]_2$ (Tungsten, hexacarbonylbis (η^5 -2,4-cyclopentadien-1-yl)di-)	12566-66-4	4CO	12.89 ± 0.10	EI	4598
$C_{13}H_{10}O_3W_2^+$	$[C_5H_5(CO)_3W]_2$ (Tungsten, hexacarbonylbis (η^5 -2,4-cyclopentadien-1-yl)di-)	12566-66-4	3CO	11.00 ± 0.20	EI	4598
$C_{11}H_{10}O_1W_2^+$	$[C_5H_5(CO)_3W]_2$ (Tungsten, hexacarbonylbis (η^5 -2,4-cyclopentadien-1-yl)di-)	12566-66-4	2CO	8.61 ± 0.05	EI	4598
$C_{13}H_{10}O_5W_2^+$	$[C_5H_5(CO)_3W]_2$ (Tungsten, hexacarbonylbis (η^5 -2,4-cyclopentadien-1-yl)di-)	12566-66-4	CO	7.70 ± 0.05	EI	4598
$C_{16}H_{10}O_6W_2^+$	$[C_5H_5(CO)_3W]_2$ (Tungsten, hexacarbonylbis (η^5 -2,4-cyclopentadien-1-yl)di-)	12566-66-4	**	6.65 ± 0.05	EI	4598
$C_3H_3NO_5W^+$	$(CO)_5NH_1W$	15133-64-9	**	7.54 (V)	PE	4252
$C_7H_7NO_5W^+$	$(CO)_5NH(CH_3)_2W$	15228-31-6	**	7.41 (V)	PE	4252
$C_8H_9NO_5W^+$	$(CO)_5N(CH_3)_3W$	15228-32-7	**	7.41 (V)	PE	4252
$C_{10}H_5NO_5W^+$	$C_5H_5NW(CO)_5$ (OC-6-22)-Pentacarbonyl(pyridine)tungsten)	14586-49-3	**	7.53 ± 0.05	EI	3498
			**	7.53	EI	5292
$C_{10}H_{11}NO_5W^+$	$(C_5H_{10}NH)(CO)_5W$ (Tungsten, pentacarbonyl(piperidine)-(OC-6-22))	31082-68-5	**	7.35 (V)	PE	5540
$C_{11}H_7NO_5W^+$	$C_5H_1N(CH_3)W(CO)_5$ (Pentacarbonyl(4-methylpyridine)tungsten)	17000-14-5	**	7.46 ± 0.05	EI	3498
			**	7.46	EI	5292
$C_{12}H_9NO_5W^+$	$C_5H_1N(CH_3)_2W(CO)_5$ (OC-6-22)-Pentacarbonyl(2,6-dimethylpyridine)tungsten)	36252-39-8	**	7.43 ± 0.05	EI	3498
			**	7.43	EI	5292
$C_{11}H_1N_2O_5W^+$	$C_5H_1N(CN)W(CO)_5$ (OC-6-22)-Pentacarbonyl(2-pyridinecarbonitrile- N^1)tungsten)	36252-42-3	**	7.65 ± 0.05	EI	3498
			**	7.65	EI	5292
$C_{12}H_{11}N_2O_5W^+$	$(C_5H_1N_2(C_2H_5)_2)(CO)_5W$	XXXXX-XX-X	**	7.02 (V)	PE	5601
$C_{21}H_{21}N_1O_1W_2^+$	$(C_5H_1N(O)CH_3)_2W_2$ (Tungsten, tetrakis[μ -(6-methyl-2(1H)-pyridinonato- $N^1:O^3$)] di-($R-R'$) stereoisomer)	67634-84-8	**	5.3 (V)	PE	5191

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
FW⁺	WF	51621-16-0	**	8.5±1	EI	4580
F₂W⁺	WF ₂	33963-15-4	**	9.0±0.3	EI	4580
F₃W⁺	WF ₃	51621-17-1	**	9.0±0.2	EI	4580
	WF ₆	7783-82-6		24.0±0.5	EI	4580
F₄W⁺	WF ₄	13766-47-7	**	9.89±0.10	EI	4580
	WF ₆	7783-82-6	2F	19.5±0.3	EI	4580
F₅W⁺	WF ₅	19357-83-6	**	14.9±0.1	PE	4989
			**	10.03±0.10	EI	4580
	WF ₆	7783-82-6	F	15.24±0.10	EI	4580
C₁₅H₂₁O₆Si₂W⁺	C ₁₅ H ₂₁ O ₆ Si ₂ W	XXXXX-XX-X	**	7.55 (V)	PE	5601
C₁₂H₁₆N₆P₂W⁺	((CH ₃) ₂ N) ₃ P) ₂ (CO) ₄ W	19976-86-4	4CO	10.7±0.05	EI	3952
C₂₀H₁₅O₂PW⁺	((C ₆ H ₅) ₃ P)(CO) ₅ W (Tungsten,pentacarbonyl(triphenylphosphine)-(OC-6-22)-)	15444-65-2	3CO	9.5	EI	5564
C₃H₉O₃PW⁺	(P(OCH ₃) ₃)(CO) ₅ W	23306-42-5	5CO	13.1	EI	5564
C₂₁H₁₅O₃PW⁺	((C ₆ H ₅) ₃ P)(CO) ₅ W (Tungsten,pentacarbonyl(triphenylphosphine)-(OC-6-22)-)	15444-65-2	2CO	9.1	EI	5564
C₁H₆O₁PW⁺	(P(OCH ₃) ₃)(CO) ₅ W	23306-42-5	4CO	12.3	EI	5564
C₇H₁₅O₁PW⁺	(P(OC ₂ H ₅) ₃)(CO) ₅ W	23306-43-6	5CO	12.2	EI	5564
C₁₆H₂₇O₁PW⁺	((n-C ₄ H ₉) ₃ P)(CO) ₅ W	17000-19-0	CO	9.4	EI	5564
C₂₂H₁₅O₁PW⁺	((C ₆ H ₅) ₃ P)(CO) ₅ W (Tungsten,pentacarbonyl(triphenylphosphine)-(OC-6-22)-)	15444-65-2	CO	8.5	EI	5564
C₅H₉O₅PW⁺	(P(OCH ₃) ₃)(CO) ₅ W	23306-42-5	3CO	11.1	EI	5564
C₈H₉O₅PW⁺	((CH ₃) ₃ P)(CO) ₅ W	26555-11-3	**	7.9	PE	5602
C₈H₁₅O₅PW⁺	(P(OC ₂ H ₅) ₃)(CO) ₅ W	23306-43-6	3CO	11.3	EI	5564
C₁₁H₁₅O₅PW⁺	((C ₂ H ₅) ₃ P)(CO) ₅ W	21321-31-3	**	7.8	PE	5602

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{23}H_{15}O_3PW^+$	$(C_6H_5)_3P(CO)_5W$	15444-65-2	**	7.36 (V)	PE	5139
	(Tungsten, pentacarbonyl (triphenylphosphine)-(OC-6-22)-)		**	7.80 ± 0.05	EI	4600
$C_{23}H_{13}O_3PW^+$	$(C_6H_5)_3P(CO)_5W$	18474-91-4	**	7.29 (V)	PE	5139
	(Tungsten, pentacarbonyl (tricyclohexylphosphine)-(OC-6-22)-)					
$C_6H_6O_6PW^+$	$(P(OCH_3)_3)(CO)_5W$	23306-42-5	$OCH_3 + CO$	13.0	EI	5564
$C_6H_6O_6PW^+$	$(P(OCH_3)_3)(CO)_5W$	23306-42-5	2CO	9.8	EI	5564
$C_8H_{10}O_6PW^+$	$(P(OC_2H_5)_3)(CO)_5W$	23306-43-6	$OC_2H_5 + CO$	12.5	EI	5564
$C_8H_{15}O_6PW^+$	$(P(OC_2H_5)_3)(CO)_5W$	23306-43-6	2CO	10.5	EI	5564
$C_7H_6O_7PW^+$	$(P(OCH_3)_3)(CO)_5W$	23306-42-5	OCH_3	11.2	EI	5564
$C_7H_9O_7PW^+$	$(P(OCH_3)_3)(CO)_5W$	23306-42-5	CO	9.0	EI	5564
$C_9H_{10}O_7PW^+$	$(P(OC_2H_5)_3)(CO)_5W$	23306-43-6	OC_2H_5	11.5	EI	5564
$C_{10}H_{15}O_7PW^+$	$(P(OC_2H_5)_3)(CO)_5W$	23306-43-6	CO	9.4	EI	5564
$C_8H_9O_8PW^+$	$((CH_3O)_3P)(CO)_5W$	23306-42-5	**	8.2	PE	5602
$C_{11}H_{15}O_8PW^+$	$((C_2H_5O)_3P)(CO)_5W$	23306-43-6	**	8.1	PE	5602
$C_{11}H_{21}O_8PW^+$	<i>iso</i> - $C_3H_7O)_3P(CO)_5W$	XXXXX-XX-X	**	7.82 (V)	PE	5139
$C_{23}H_{15}O_8PW^+$	$(C_6H_5O)_3P(CO)_5W$	23306-41-4	**	7.90 (V)	PE	5139
	(Tungsten, pentacarbonyl (triphenyl phosphite-P)-(OC-6-22)-)					
$C_{10}H_{30}O_1P_2W^+$	$C_{10}H_{30}O_1P_2W$	16743-03-6	**	7.50 ± 0.05	EI	4600
	(Tungsten, tetracarbonylbis(triphenylphosphine)-(OC-6-12)-)					
$C_{11}H_{18}N_3O_5PW^+$	$((CH_3)_2N)_3P(CO)_5W$	19976-82-0	**	7.9	PE	5602
$C_{11}H_{36}N_6O_2P_2W^+$	$((CH_3)_2N)_3P_2(CO)_1W$	19976-86-4	2CO	12.2 ± 0.05	EI	3952
$C_{13}H_{36}N_6O_3P_2W^+$	$((CH_3)_2N)_3P_2(CO)_1W$	19976-86-4	CO	10.3 ± 0.05	EI	3952
$C_{16}H_{36}N_6O_1P_2W^+$	$((CH_3)_2N)_3P_2(CO)_1W$	19976-86-4	**	5.5 ± 0.05	EI	3952

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$\text{F}_{18}\text{P}_6\text{W}^+$	$(\text{PF}_3)_6\text{W}$	13815-35-5	**	9.30 (V)	PE	4456
$\text{C}_3\text{H}_9\text{N}_3\text{F}_{12}\text{P}_6\text{W}^+$	$(\text{CH}_3\text{N}(\text{PF}_2)_2)_3\text{W}$	63371-85-7	**	7.70 (V)	PE	5376
$\text{C}_5\text{O}_3\text{F}_3\text{PW}^+$	$(\text{PF}_3)(\text{CO})_5\text{W}$	18461-47-7	** **	8.68 (V) 8.9	PE PE	5539 5602
CSW^+	$\text{CS}(\text{CO})_5\text{W}$	50358-92-4	5CO	18.07 ± 0.04	EI	5291
C_2OSW^+	$\text{CS}(\text{CO})_5\text{W}$	50358-92-4	4CO	15.83 ± 0.04	EI	5291
$\text{C}_3\text{O}_2\text{SW}^+$	$\text{CS}(\text{CO})_5\text{W}$	50358-92-4	3CO	13.46 ± 0.04	EI	5291
$\text{C}_4\text{O}_3\text{SW}^+$	$\text{CS}(\text{CO})_5\text{W}$	50358-92-4	2CO	11.61 ± 0.04	EI	5291
$\text{C}_5\text{O}_4\text{SW}^+$	$\text{CS}(\text{CO})_5\text{W}$	50358-92-4	CO	9.74 ± 0.04	EI	5291
$\text{C}_6\text{O}_5\text{SW}^+$	$\text{CS}(\text{CO})_5\text{W}$	50358-92-4	** **	8.08 (V) 8.22 ± 0.01	PE EI	5518 5291
F_2SW^+	WSF_2	41831-78-1	**	9.5 ± 0.3	EI	4580
F_3SW^+	WSF_3^+	41831-79-2	**	9.0 ± 0.3	EI	4580
F_4SW^+	WSF_4	XXXXX-XX-X	**	12.0 ± 0.3	EI	4580
$\text{F}_2\text{S}_2\text{W}^+$	WS_2F_2	41831-81-6	**	10.0 ± 0.3	EI	4580
ClW^+	WCl_6	13283-01-7		22.9	EI	3783
Cl_2W^+	WCl_6	13283-01-7		19.4	EI	3783
Cl_3W^+	WCl_6	13283-01-7		15.4	EI	3783
Cl_4W^+	WCl_6	13283-01-7		11.4	EI	3783
Cl_5W^+	WCl_5 WCl_6	13470-14-9 13283-01-7	**	8.84 (V) 10.9	PE EI	4764 3783
Cl_6W^+	WCl_6	13283-01-7	**	9.5	EI	3783
$\text{C}_5\text{O}_3\text{PCl}_3\text{W}^+$	$(\text{PCl}_2)(\text{CO})_5\text{W}$	21223-85-8	**	8.39 (V)	PE	5539

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
O_5VW^+	VW_2O_8	XXXXX-XX-X		11.7 ± 0.3	EI	4131
$O_{10}V_3W^+$	V_3WO_{10}	XXXXX-XX-X **		11.5 ± 0.3	EI	4131
$O_8VW_2^+$	VW_2O_8	XXXXX-XX-X **		10.4 ± 0.2	EI	4131
$O_9V_2W_2^+$	$V_2W_2O_{10}$	XXXXX-XX-X		12.2 ± 0.2	EI	4131
$O_{10}V_2W_2^+$	$V_2W_2O_{10}$	XXXXX-XX-X **		11.9 ± 0.2	EI	4131
$O_{13}V_3W_2^+$	$V_3W_2O_{13}$	XXXXX-XX-X **		11.1 ± 0.2	EI	4131
$O_{11}VW_3^+$	VW_3O_{11}	XXXXX-XX-X **		10.7 ± 0.2	EI	4131
$O_{13}V_2W_{13}^+$	$V_2W_{13}O_{14}$	XXXXX-XX-X 0		12.3 ± 0.4	EI	4131
$C_{23}H_{15}O_5AsW^+$	$(C_6H_5)_4As(CO)_5W$ (Tungsten, pentacarbonyl (triphenylarsine)-(OC-6-22)-)	29743-02-0	**	7.37 (V)	PE	5139
BrW^+	WBr_1 WBr_5 $WOBr_1$	14055-81-3 13470-11-6 13520-77-9	3Br 4Br	19.4 ± 0.3 20.9 ± 0.3 26.1 ± 0.5	EI EI EI	4906 4906 4906
Br_2W^+	WBr_1 WBr_5 $WOBr_1$	14055-81-3 13470-11-6 13520-77-9	2Br 3Br	15.1 ± 0.3 16.6 ± 0.2 20.9 ± 0.4 21.4 ± 0.5	EI EI EI EI	4906 4906 4906 3450
Br_3W^+	WBr_1 WBr_5 $WOBr_1$	14055-81-3 13470-11-6 13520-77-9	Br 2Br	11.2 ± 0.2 13.4 ± 0.2 17.9 ± 0.4 18.1 ± 0.5	EI EI EI EI	4906 4906 4906 3450
Br_1W^+	WBr_1 WBr_5	14055-81-3 13470-11-6	** Br	8.2 ± 0.2 10.0 ± 0.2	EI EI	4906 4906
Br_3W^+	WBr_5	13470-11-6	**	8.3 ± 0.2	EI	4906
$Br_3W_2^+$	W_2Br_6	56729-72-7	3Br	19.5 ± 0.3	EI	4906
$Br_1W_2^+$	W_2Br_6	56729-72-7	2Br	15.2 ± 0.3	EI	4906
$Br_3W_2^+$	W_2Br_6	56729-72-7	Br	11.0 ± 0.2	EI	4906

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
Br_6W_2^+	W_2Br_6	56729-72-7	**	9.0 ± 0.2	EI	4906
OBrW^+	WO_3Br_2	13520-75-7		20.0 ± 0.8	EI	3450
	WOBr_1	13520-77-9		18.3 ± 0.5	EI	4906
				18.1 ± 0.8	EI	3450
O_2BrW^+	WO_2Br_2	13520-75-7		13.0 ± 0.4	EI	3450
OBr_2W^+	WOBr_1	13520-77-9		14.5 ± 0.2	EI	4906
				14.4 ± 0.5	EI	3450
$\text{O}_2\text{Br}_2\text{W}^+$	WO_2Br_2	13520-75-7	**	11.4 ± 0.2	EI	3450
OBr_3W^+	WOBr_1	13520-77-9		10.5 ± 0.2	EI	4906
				10.3 ± 0.2	EI	3450
OBr_1W^+	WOBr_1	13520-77-9	**	10.3 ± 0.3	EI	3450
$\text{C}_{21}\text{H}_{21}\text{N}_1\text{O}_1\text{MoW}^+$	(C ₅ H ₅ N(O)CH ₃)WMo (Tungsten,tetrakis[μ-(6-methyl-2(1H)-pyridinonato-N ¹ ,O ²)] (molybdenum)-(Mo-W))	67577-06-4	**	5.60 (V)	PE	5191
$\text{C}_{13}\text{H}_{20}\text{SnW}^+$	(C ₅ H ₅) ₂ (Sn(CH ₃) ₃)WH (Tungsten,bis(η ⁵ -2,4-cyclopentadien-1-yl)hydro(trimethylstannyl)-)	51192-18-8	**	6.18 ± 0.11	EI	5321
$\text{C}_{23}\text{H}_{15}\text{O}_5\text{SbW}^+$	(C ₆ H ₅) ₃ (CO) ₅ SbW (Tungsten, pentacarbonyl(triphenylstibine)-(OC-6-22)-)	29743-03-1	**	7.90 ± 0.05	EI	4600
O_2IW^+	WO_2I_2	14447-89-3		12.5 ± 0.5	EI	3451
$\text{O}_2\text{I}_2\text{W}^+$	WO_2I_2	14447-89-3	**	10.4 ± 0.4	EI	3451
Re^+	Re	7440-15-5	**	7.76 ± 0.03	EI	5342
$\text{C}_6\text{H}_{18}\text{Re}^+$	(CH ₃) ₆ Re	56090-02-9	**	7.89 ± 0.03 (V)	PE	4733
$\text{C}_{10}\text{H}_{11}\text{Re}^+$	(C ₅ H ₅) ₂ HRe (Rhenium, bis(η ⁵ -2,4-cyclopentadien-1-yl)hydro-)	1271-32-5	**	6.4 ± 0.1 (V)	PE	4425
ORe^+	ReO_3	1314-28-9		~18	EI	4016
O_2Re^+	ReO_3	1314-28-9		14.4 ± 1.0	EI	4016
	Re_2O_7	1314-68-7		21.9 ± 1.0	EI	4016

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
O_3Re^+	ReO_3	1314-28-9	**	12.1 ± 0.3	EI	4245
			**	12.5 ± 0.4	EI	4016
	Re_2O_7	1314-68-7		16.2 ± 0.5	EI	4016
O_5Re_2^+	Re_2O_7	1314-68-7		17.5 ± 0.2	EI	4016
O_6Re_2^+	Re_2O_7	1314-68-7		16.2 ± 0.5	EI	4016
O_7Re_2^+	Re_2O_7	1314-68-7	**	12.7 ± 0.2	EI	4016
$\text{C}_{10}\text{O}_{10}\text{Re}_2^+$	$(\text{CO})_{10}\text{Re}_2$	14285-68-8	**	8.07 (V)	PE	4492
			**	8.86 (V)	PE	4448
$\text{C}_1\text{H}_{12}\text{ORe}^+$	$(\text{CH}_3)_4\text{ORe}$	53022-70-1	**	8.86 ± 0.05 (V)	PE	4733
$\text{C}_8\text{H}_5\text{O}_3\text{Re}^+$	$\text{C}_5\text{H}_3(\text{CO})_3\text{Re}$ (Rhenium, tricarbonyl (η^5 -2,4-cyclopentadien-1-yl)-)	12079-73-1	**	8.13 (V)	PE	4570
$\text{C}_5\text{HO}_5\text{Re}^+$	$(\text{CO})_5\text{ReH}$	16457-30-0	**	8.86 ± 0.02 (V)	PE	3827
			**	8.89 ± 0.08	PE	4492
			**	8.94 (V)	PE	4448
$\text{C}_6\text{H}_3\text{O}_5\text{Re}^+$	$(\text{CO})_5\text{CH}_3\text{Re}$	14524-92-6	**	8.71 ± 0.05 (V)	PE	4492
			**	8.72 (V)	PE	4448
$\text{C}_{12}\text{H}_3\text{O}_{12}\text{Re}_3^+$	$(\text{CO})_{12}\text{Re}_3\text{H}_3$	XXXXXX-XX-X	**	8.45 (V)	PE	5547
	$(\text{CO})_{12}\text{Re}_3\text{H}_3$	73463-62-4	**	8.45 (V)	PE	5357
	(Rhenium, dodecacarbonyltri- μ -hydrotri-triangularo)					
F_6Re^+	ReF_6	10049-17-9	**	7.99	S	3565
			**	11.1 ± 0.1	PE	4989
F_7Re^+	ReF_7	17029-21-9	**	14.1 ± 0.1	PE	4989
O_3FRe^+	ReO_3F	42246-24-2	**	12.37 ± 0.1 (V)	PE	4989
OF_5Re^+	ReOF_5	23377-53-9	**	13.2 ± 0.1	PE	4989
$\text{C}_7\text{O}_6\text{F}_3\text{Re}^+$	$\text{COCF}_3(\text{CO})_5\text{Re}$	55615-47-9	**	8.80 (V)	PE	4448
O_1NaRe^+	NaReO_4	XXXXXX-XX-X	**	10.62 ± 0.03 (V)	PE	4806
$\text{C}_3\text{H}_3\text{O}_5\text{SiRe}^+$	$(\text{SiH}_3)(\text{CO})_5\text{Re}$	40628-33-9	**	8.9 ± 0.1 (V)	PE	3827

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{16}H_{11}OSi_4Re^+$	$((CH_3)_3SiCH_2)_4ORe$	56519-47-2	**	8.00 ± 0.1 (V)	PE	4733
Cl_3Re^+	$ReCl_3$ (JC—Mean value of Jahn–Teller components)	13596-35-5	**	9.50 (V)	PE	4764
$Cl_9Re_3^+$	Re_3Cl_9 (Rhenium, tri- μ -chlorohexachlorotri- <i>triangulo</i>)	14973-59-2	**	9.15 ± 0.05 (V)	PE	5024
$C_5O_5ClRe^+$	$(CO)_5ReCl$	14099-01-5	**	8.80 (V)	PE	4448
			**	9.02 (V)	PE	4167
			**	9.06 (V)	PE	4492
O_1KRe^+	$KReO_4$	XXXXX-XX-X	**	9.98 ± 0.05 (V)	PE	4806
$C_5H_3O_5CeRe^+$	$(GeH_3)(CO)_5Re$	30012-26-1	**	8.9 ± 0.1 (V)	PE	3827
$Br_9Re_3^+$	Re_3Br_9 (Rhenium, tri- μ -bromohexabromotri- <i>triangulo</i>)	33517-16-7	**	8.72 ± 0.10 (V)	PE	5024
$C_5O_5BrRe^+$	$(CO)_5ReBr$	14220-21-4	**	8.80 (V)	PE	4448
			**	8.83 (V)	PE	4492
			**	8.86 (V)	PE	4167
O_1RbRe^+	$RbReO_4$	XXXXX-XX-X	**	10.03 ± 0.06 (V)	PE	4806
$C_8H_9O_5SnRe^+$	$((CH_3)_3Sn)(CO)_5Re$	15219-90-6	**	8.30 ± 0.10	EI	5321
$C_{24}H_{15}O_5SnRe^+$	$((C_6H_5)_3Sn)(CO)_5Re$ (Rhenium, pentacarbonyl(triphenylstannyl)-(OC-6-22)-)	15614-21-8	**	7.98 ± 0.09	EI	5321
O_3IRe^+	ReO_3I	39327-80-5	**	10.9 ± 0.5	EI	4013
$C_5O_3IRe^+$	$(CO)_3ReI$	13821-00-6	**	8.32 (V)	PE	4448
			**	8.36 (V)	PE	4492
			**	8.50 (V)	PE	4167
O_1CsRe^+	$CsReO_4$	XXXXX-XX-X	**	9.83 ± 0.03 (V)	PE	4806
O_1BaRe^+	$Ba(ReO_4)_2?$	XXXXX-XX-X		13.4 ± 0.5	EI	4108
Os^+	Os	7440-04-2	**	8.15 ± 0.09	EI	5342
$C_{12}H_{11}Os^+$	$(C_3H_7CH_2)_2Os$ (Osmocene, 1,1'-dimethyl-)	40672-07-9	**	6.93 (V)	PE	3688
O_4Os^+	OsO_4	20816-12-0	**	12.320	PE	3836
			**	12.35 ± 0.02 (V)	PE	5148

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
O₁Os⁺	OsO ₁	20816-12-0	**	12.35	PE	4166
			**	12.39	PE	3838
C₁₂O₁₂Os₃⁺	(CO) ₁₂ Os ₃	15696-40-9	**	7.83 (V)	PE	5547
			**	7.83±0.2 (V)	PE	4882
			**	7.83 (V)	PE	5357
C₁₈O₁₈Os₆⁺	(CO) ₁₈ Os ₆ (Osmium, octadecacarbonylhexas-)	37216-50-5	**	7.50±0.2 (V)	PE	4882
Ir⁺	Ir	7439-88-5	**	8.8±0.7	EI	5303
			**	8.87±0.05	EI	5342
C₇H₇O₁Ir⁺	(CH ₃ COCHCOCH ₃)Ir(CO) ₂ (Dicarbonyl(2,4-pentanedionato)iridium)	14023-80-4	**	8.6±0.1	EI	3497
C₇HO₁F₆Ir⁺	(CF ₃ COCHCOCF ₃)Ir(CO) ₂ (Dicarbonyl(1,1,1,5,5,5-hexafluoro-2,4-pentanedionato)iridium)	14049-69-5	**	8.85±0.05	EI	3497
HF₁₂P₁Ir⁺	H(PF ₃) ₁ Ir	22372-64-1	**	9.82 (V)	PE	4456
LaIr⁺	LaIr	53095-72-0	**	6.0±1.0	EI	5303
CeIr⁺	IrCe	53239-19-3	**	6.0±1.0	EI	4209
Pt⁺	Pt	7440-06-4	**	8.82±0.04	EI	5342
C₆H₁₀Pt⁺	(C ₃ H ₅) ₂ Pt	12240-88-9	**	7.91 (V)	PE	5281
C₈H₁₁Pt⁺	(CH ₂ C(CH ₃)CH ₂) ₂ Pt	33010-07-0	**	7.65 (V)	PE	5281
C₁₀H₁₆O₁Pt⁺	((CH ₃ CO) ₂ CH ₂)Pt	XXXXX-XX-X	**	7.60 (V)	PE	5568
C₈H₂₁P₂Pt⁺	C ₈ H ₂₁ P ₂ Pt	51351-75-8	**	7.68 (V)	PE	4739
C₁₈H₂₈P₂Pt⁺	C ₁₈ H ₂₈ P ₂ Pt (Platinum, bis(dimethylphenylphosphine)dimethyl-(SP-4-2)-)	24917-48-4	**	7.43 (V)	PE	4739
F₁₂P₁Pt⁺	Pt(PF ₃) ₁	19529-53-4	**	8.89±0.03	PE	4187
C₈H₂₀O₁P₂S₁Pt⁺	Pt(S ₂ P(OC ₂ H ₅) ₂) ₂	37583-01-0	**	7.60±0.05	PE	4636
C₇H₂₁P₂ClPt⁺	C ₇ H ₂₁ P ₂ ClPt	36512-52-4	**	7.76 (V)	PE	4739

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₁₇H₂₃P₂ClPt⁺	C ₁₇ H ₂₃ P ₂ ClPt (Platinum, chlorobis(dimethylphenylphosphine)methyl-(SP-4-3)-)	24833-58-7	**	7.54 (V)	PE	4739
C₆H₁₈P₂Cl₂Pt⁺	C ₆ H ₁₈ P ₂ Cl ₂ Pt	21545-76-6	**	7.86 (V)	PE	4739
TiPt⁺	PtTi	12038-31-2	**	10.1±1.0	EI	5150
C₁₇H₂₃P₂BrPt⁺	C ₁₇ H ₂₃ P ₂ BrPt (Platinum, bromobis(dimethylphenylphosphine)methyl-(SP-4-3)-)	24833-62-3	**	7.43 (V)	PE	4739
C₇H₂₁P₂IPt⁺	C ₇ H ₂₁ P ₂ IPt	68146-10-1	**	7.33 (V)	PE	4739
C₁₇H₂₃P₂IPt⁺	C ₁₇ H ₂₃ P ₂ IPt (Platinum, bis(dimethylphenylphosphine)iodomethyl-(SP-4-3)-)	24882-77-7	**	7.12 (V)	PE	4739
C₆H₁₈P₂I₂Pt⁺	<i>trans</i> -((CH ₃) ₃ P) ₂ I ₂ Pt	15703-03-4	**	7.49 (V)	PE	4739
C₁₆H₂₂P₂I₂Pt⁺	C ₁₆ H ₂₂ P ₂ I ₂ Pt (Platinum, bis(dimethylphenylphosphine)diiodo-(SP-4-1)-)	41119-53-3	**	7.39 (V)	PE	4739
CePt⁺	PtCe	12157-68-5	**	6.4±1.0	EI	4209
Au⁺	Au	7440-57-5	**	9.23	S	5500
(²P ⁰)						
(¹S ₀)				9.22	PE	4858
(³D ₃)				11.08	PE	4858
(¹D ₂)				11.41	PE	4858
(³D ₁)				12.66	PE	4858
(¹D ₂)				12.89	PE	4858
				8.5±0.8	EI	3978
				9.0±0.5	EI	3473
				9.21±0.05	EI	3745
				7.8	EI	4578
Au₂⁺	Au ₂	12187-09-6	**	9.5±0.3	EI	4014
			**	8.7±1.0	EI	5391
			**	9.5±0.3	EI	4005
			**	9.7±0.4	EI	3468
BAu⁺	AuB	12408-81-0	**	8.7±0.5	EI	3468
BOAu⁺	AuBO	12588-90-8	**	9.7±0.2	EI	3473
NaAu⁺	NaAu	61115-29-5	**	6.2	EI	4578
			**	8.5±1.5	EI	4919
AlAu⁺	AuAl	12250-38-3	**	7.6±0.3	EI	4014
			**	7.6±0.3	EI	4005

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
AlAu⁺	AuAl	12250-38-3	**	7.8±0.3	EI	3440
			**	9.0±1.0	EI	3796
Al₂Au⁺	AuAl ₂	12004-03-4	**	6.2±1.0	EI	3966
AlAu₂⁺	Au ₂ Al	12250-39-4	**	7.7±1.0	EI	3966
C₁H₁₂PAu⁺	((CH ₃) ₃ P)(CH ₃)Au	32407-79-7	**	8.27 (V)	PE	4739
C₆H₁₈PAu⁺	((CH ₃) ₃ P)(CH ₃) ₃ Au	33012-33-8	**	7.80 (V)	PE	4739
C₁₁H₂₀PAu⁺	C ₁₁ H ₂₀ PAu	54854-73-8	**	7.69 (V)	PE	4739
	(Gold, (dimethylphenylphosphine)trimethyl-(SP-4-2)-)					
C₁₆H₂₂PAu⁺	C ₁₆ H ₂₂ PAu	52170-97-5	**	7.64 (V)	PE	4739
	(Gold, trimethyl(methyldiphenylphosphine)-(SP-4-2)-)					
GeAu⁺	AuGe	12256-41-6	**	7.7	EI	3775
CsAu⁺	CsAu	12256-37-0	**	6.6±0.3	EI	5153
LaAu⁺	LaAu	12429-32-2	**	5.8±1.0	EI	5303
CeAu⁺	AuCe	12408-82-1	**	6.0±0.3	EI	3468
AuEu⁺	EuAu	56214-25-6	**	5.6±1.0	EI	4529
Au₂Eu⁺	EuAu ₂	51198-56-2	**	5.9±1.0	EI	4529
HoAu⁺	AuHo	12044-80-3	**	6.2±0.5	EI	3440
Hg⁺ (² S _{1/2}) (² D _{5/2}) (² S _{1/2}) (² D _{5/2}) (² D _{3/2}) (² D _{3/2}) (² P _{3/2})	Hg	7439-97-6	**	10.4	PE	3672
			**	14.8	PE	3672
			**	10.487±0.005	PEN	3541
			**	14.907±0.015	PEN	3541
			**	16.787±0.015	PEN	3541
			**	18.050±0.050	PEN	3541
			**	10.47±0.05	EI	3745
Hg₂⁺	Hg ₂	12596-25-7	**	9.40±0.08	EI	5428
Hg₃⁺	Hg ₃	11062-37-6	**	8.90±0.08	EI	5428
Hg₁⁺	Hg ₁	XXXXX-XX-X	**	8.65±0.08	EI	5428

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
Hg_5^+	Hg_5	XXXXX-XX-X **		8.60 ± 0.08	EI	5428
Hg_6^+	Hg_6	XXXXX-XX-X **		8.50 ± 0.08	EI	5428
Hg_7^+	Hg_7	XXXXX-XX-X **		8.35 ± 0.08	EI	5428
Hg_8^+	Hg_8	XXXXX-XX-X **		8.28 ± 0.08	EI	5428
Hg_9^+	Hg_9	XXXXX-XX-X **		8.25 ± 0.08	EI	5428
Hg_{10}^+	Hg_{10}	XXXXX-XX-X **		8.25 ± 0.08	EI	5428
Hg_{11}^+	Hg_{11}	XXXXX-XX-X **		8.22 ± 0.08	EI	5428
Hg_{12}^+	Hg_{12}	XXXXX-XX-X **		8.12 ± 0.08	EI	5428
$\text{C}_{12}\text{H}_{10}\text{Hg}^+$	$(\text{C}_6\text{H}_5)_2\text{Hg}$ (Mercury, diphenyl-)	587-85-9	**	8.30 ± 0.03	PI	4055
$\text{C}_2\text{H}_6\text{Hg}^+$	$(\text{CH}_3)_2\text{Hg}$	593-74-8	**	9.3 (V)	PE	5300
				9.33 (V)	PE	4574
$\text{C}_3\text{H}_8\text{Hg}^+$	$(\text{CH}_3)(\text{C}_2\text{H}_5)\text{Hg}$	29138-86-1	**	8.84 (V)	PE	4574
$\text{C}_1\text{H}_{10}\text{Hg}^+$	$(\text{C}_2\text{H}_5)_2\text{Hg}$	627-44-1	**	8.45 (V)	PE	4574
			**	8.9 (V)	PE	5300
	$(\text{CH}_3)(\text{iso}-\text{C}_3\text{H}_7)\text{Hg}$	29138-88-3	**	8.48 (V)	PE	4574
$\text{C}_3\text{H}_{12}\text{Hg}^+$	$(\text{C}_2\text{H}_5)(\text{iso}-\text{C}_3\text{H}_7)\text{Hg}$	59049-79-5	**	8.18 (V)	PE	4574
	$(\text{CH}_3)(\text{iso}-\text{C}_3\text{H}_7)\text{Hg}$	59643-44-6	**	8.75 (V)	PE	4574
	$(\text{CH}_3)(\text{tert}-\text{C}_3\text{H}_7)\text{Hg}$	59049-78-4	**	8.31 (V)	PE	4574
$\text{C}_6\text{H}_{11}\text{Hg}^+$	$(n-\text{C}_7\text{H}_{15})_2\text{Hg}$	628-85-3	**	8.29 (V)	PE	4574
	$(\text{iso}-\text{C}_7\text{H}_{15})_2\text{Hg}$	1071-39-2	**	8.03 (V)	PE	4574
	$(\text{C}_2\text{H}_5)(\text{tert}-\text{C}_4\text{H}_9)\text{Hg}$	59049-80-8	**	8.06 (V)	PE	4574
$\text{C}_7\text{H}_{16}\text{Hg}^+$	$\text{C}_7\text{H}_{16}\text{Hg}$	59049-81-9	**	7.73 (V)	PE	4574
$\text{C}_8\text{H}_{18}\text{Hg}^+$	$(n-\text{C}_7\text{H}_{15})_2\text{Hg}$	629-35-6	**	8.35 (V)	PE	4574
	$(\text{iso}-\text{C}_7\text{H}_{15})_2\text{Hg}$	24470-76-6	**	8.30 (V)	PE	4574
	$(\text{tert}-\text{C}_4\text{H}_9)_2\text{Hg}$	23587-90-8	**	7.57 (V)	PE	4574
$\text{C}_9\text{H}_{20}\text{Hg}^+$	$(\text{iso}-\text{C}_8\text{H}_{17})(\text{neo}-\text{C}_5\text{H}_{11})\text{Hg}$	59643-45-7	**	8.33 (V)	PE	4574

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_{10}H_{10}Hg^+$	$(C_5H_5)_2Hg$ (Mercurocene)	12083-67-9	**	8.4 ± 0.1 (V)	PE	4853
$C_{10}H_{22}Hg^+$	$(neo-C_5H_{11})_2Hg$	10284-49-8	**	8.30 (V)	PE	4574
$C_8H_6O_2Hg^+$	$(C_4H_5O)_2Hg$ (Mercury, di-2-furanyl-)	28752-79-6	**	8.39 (V)	PE	5323
	$(C_4H_5O)_2Hg$ (Mercury, di-3-furanyl-)	28752-80-9	**	8.70 (V)	PE	5323
$CN_3F_3Hg^+$	CF_3N_3Hg	51353-52-7	**	9.87 (V)	PE	4512
$C_2NOF_3Hg^+$	CF_3NCOHg	51353-51-6	**	10.83 (V)	PE	4512
$CNO_3F_3Hg^+$	CF_3ONO_2Hg	461-40-5	**	11.07 (V)	PE	4512
$C_{11}H_{38}Si_1Hg^+$	$(CH(Si(CH_3)_3))_2Hg$	13294-24-1	**	8.12 ± 0.05 (V)	PE	4725
$C_{12}H_{36}N_2Si_1Hg^+$	$(N(Si(CH_3)_3))_2Hg$	4104-81-8	**	8.33 ± 0.05 (V)	PE	4725
$C_8H_6S_2Hg^+$	$(C_4H_5S)_2Hg$ (Mercury, di-2-thienyl-)	5980-89-2	**	8.47 (V)	PE	5323
	$(C_4H_5S)_2Hg$ (Mercury, di-3-thienyl-)	28752-81-0	**	8.72 (V)	PE	5323
$C_2F_6S_2Hg^+$	$(SCF_3)_2Hg$	XXXXX-XX-X	**	10.2 (V)	PE	4512
Cl_2Hg^+	$HgCl_2$	7487-94-7	**	11.5 (V)	PE	3963
$C_3H_5ClHg^+$	$CH_2=CHCH_2HgCl$	14155-77-2	**	9.35 (V)	PE	3859
$C_7H_7ClHg^+$	$C_6H_5CH_2HgCl$ (Mercury, chloro(phenylmethyl)-)	2117-39-7	**	8.65 (V)	PE	4490
$C_4H_3OClHg^+$	$C_4H_3O(HgCl)$ (Mercury, chloro-2-furanyl-)	5857-37-4	**	8.96 (V)	PE	5323
	$C_4H_3O(HgCl)$ (Mercury, chloro-3-furanyl-)	5857-38-5	**	9.10 (V)	PE	5323
$C_3H_5OClHg^+$	$C_3H_5O(CH_2HgCl)$ (Mercury, chloro(3-furanylmethyl)-)	73057-78-0	**	8.80 (V)	PE	5323
$C_4H_3SClHg^+$	$C_4H_3S(HgCl)$ (Mercury, chloro-2-thienyl-)	5857-39-6	**	9.05 (V)	PE	5323
	$C_4H_3S(HgCl)$ (Mercury, chloro-3-thienyl-)	73057-79-1	**	9.23 (V)	PE	5323

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$C_3H_5SCHg^+$	$C_3H_5S(CH_2HgCl)$ (Mercury, chloro(3-thienylmethyl)-)	73057-80-4	**	8.79 (V)	PE	5323
CF_3IHg^+	CF_3HgI	421-11-4	**	9.89 (V)	PE	4512
Tl^+	$TlBO_2$	XXXXX-XX-X BO_2		10.43 ± 0.07	EI	4096
Tl_2^+	Tl_2O	1314-12-1		11.97 ± 0.09	EI	4096
$C_5H_5Tl^+$	C_5H_5Tl (Thallium, (η^5 -2,4-cyclopentadien-1-yl)-)	34822-90-7	**	7.96 (V)	PE	4777
			**	8.12 ± 0.05 (V)	PE	4853
OTl^+	$TlBO_2$	XXXXX-XX-X		10.68 ± 0.11	EI	4096
OTl_2^+	Tl_2O	1314-12-1	**	8.02 ± 0.10	EI	4096
BO_2Tl^+	$TlBO_2$	XXXXX-XX-X	**	10.2 ± 0.05 (V)	PE	4871
			**	9.92 ± 0.11	EI	4096
$BO_2Tl_2^+$	$(TlBO_2)_2$	XXXXX-XX-X		9.17 ± 0.10	EI	4096
NO_3Tl^+	$TlNO_3$	XXXXX-XX-X	**	9.9 ± 0.05 (V)	PE	4871
FTl^+	TlF	7789-27-7	**	10.80 ± 0.02 (V)	PE	4552
$(^2\Sigma)$			**	11.90 ± 0.02 (V)	PE	4552
$(^2\Pi)$			**	14.20 ± 0.02 (V)	PE	4552
$(^2\Sigma)$			**	10.52	PE	3971
$(^2\Sigma)$			**	11.15	PE	3971
$(^2\Pi)$			**	14.05	PE	3971
FTl_2^+	$(TlF)_2$	31970-97-5		9.97 ± 0.02	PI	3971
$F_2Tl_2^+$	$(TlF)_2$	31970-97-5	**	9.71 ± 0.02	PI	3971
			**	9.62	PE	3971
			**	9.96 ± 0.02 (V)	PE	4552
$O_3STl_2^+$	Tl_2SO_4	XXXXX-XX-X	**	9.8 ± 0.05 (V)	PE	4871
$CITl^+$	$TlCl$	7791-12-0	**	9.894 (V)	PE	3913
$(^2\Sigma)$			**	9.91 (V)	PE	4826
$(^2\Sigma_{1/2})$			**	9.92 (V)	PE	4713
$(^2\Pi)$			**	9.925 (V)	PE	3536
$(^2\Pi_{1/2} + ^2\Pi_{1/2})$			**	10.38 (V)	PE	4713
$(^2\Pi)$			**	10.384 (V)	PE	3913
$(^2D_{3/2})$			**	11.04 (V)	PE	4713
$(^2D_{1/2})$			**	11.95 (V)	PE	4713

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
CtI⁺						
^{(2)Π_{3/2}}	TlCl	7791-12-0	**	10.38 (V)	PE	4713
^{(2)D_{3/2}}			**	13.17 (V)	PE	4713
^{(2)D_{5/2}}			**	13.41 (V)	PE	4713
^{(2)D_{5/2}}			**	13.68 (V)	PE	4713
^{(2)Σ}			**	13.79	PE	3913
^{(2)Σ_{1/2}}			**	13.89 (V)	PE	4713
^{(2)D_{3/2}}			**	15.86 (V)	PE	4713
^{(2)Π_{1/2}}			**	18.55 (V)	PE	4713
^{(2)Π_{3/2}}			**	20.23 (V)	PE	4713
^{(2)D_{5/2}}			**	20.97 (V)	PE	4713
^{(2)D_{5/2}}			**	21.16 (V)	PE	5035
^{(2)D_{5/2}}			**	21.24 (V)	PE	4713
^{(2)D_{5/2}}			**	21.41 (V)	PE	4713
^{(2)D_{3/2}}			**	23.30 (V)	PE	4713
^{(2)D_{3/2}}			**	23.32 (V)	PE	5035
^{(2)D_{3/2}}			**	23.42 (V)	PE	4713
AsTl⁺						
	TlAs	12006-09-6	**	9±1	EI	3947
BrTl⁺						
^{(2)Σ_{1/2}}	TlBr	7789-40-4	**	9.50 (V)	PE	4713
^{(2)Π}			**	9.832 (V)	PE	3913
^{(2)Π_{3/2}+²Π_{1/2}}			**	9.85 (V)	PE	4713
^{(2)Σ}			**	13.57	PE	3913
^{(2)Σ_{1/2}}			**	13.69 (V)	PE	4713
^{(2)Π_{1/2}?}			**	17.78 (V)	PE	4713
^{(2)Π_{3/2}}			**	20.60 (V)	PE	4713
^{(2)D_{5/2}}			**	20.86 (V)	PE	4713
^{(2)D_{5/2}}			**	21.04 (V)	PE	5035
^{(2)D_{5/2}}			**	21.13 (V)	PE	4713
^{(2)D_{3/2}}			**	23.11 (V)	PE	4713
^{(2)D_{3/2}}			**	23.23 (V)	PE	5035
^{(2)D_{3/2}}			**	23.25 (V)	PE	4713
ITl⁺						
	TlI	7790-30-9	**	8.47±0.02	PI	3536
^{(2)Σ_{1/2},²Π_{3/2}}			**	8.47±0.02	PE	3913
^{(2)Σ_{1/2}+²Π_{3/2}}			**	8.89 (V)	PE	4713
			**	8.93 (V)	PE	3676
^{(2)Π}			**	9.39	PE	3913
^{(2)Π_{1/2}}			**	9.73 (V)	PE	4713
^{(2)Σ}			**	13.0	PE	3913
^{(2)Σ_{1/2}}			**	13.10 (V)	PE	4713
^{(2)Σ_{1/2}}			**	13.47 (V)	PE	4713
^{(2)Π_{1/2}?}			**	18.07 (V)	PE	4713
^{(2)D_{5/2}}			**	20.59 (V)	PE	4713
^{(2)D_{5/2}}			**	20.75 (V)	PE	5035
^{(2)D_{5/2}}			**	20.78 (V)	PE	4713
^{(2)D_{3/2}}			**	22.87 (V)	PE	4713
^{(2)D_{3/2}}			**	23.04 (V)	PE	5035
^{(2)D_{3/2}}			**	23.05	PE	4713
O₁ReTl⁺						
	TlReO ₄	XXXXX-XX-X	**	10.6±0.05 (V)	PE	4871
Pb⁺						
^{(2)P_{1/2}}	Pb	7439-92-1	**	7.417	S	5449
^{(2)P_{3/2}}			**	9.163	S	5449
^{(2)P_{1/2}}			**	7.42±0.01	PE	5534
^{(2)P_{3/2}}			**	9.16±0.01	PE	5534
^{(1)P_{1/2}}			**	14.59±0.01	PE	5534

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
Pb⁺						
(¹ P _{3/2})	Pb	7439-92-1	**	15.61±0.01	PE	5534
(² D _{3/2})			**	15.97±0.01	PE	5534
(² D _{5/2})			**	16.06±0.01	PE	5534
(¹ P _{5/2})			**	16.57±0.01	PE	5534
(² P _{1/2})			**	18.35±0.01	PE	5534
LiPb⁺	PbLi	12372-50-8	**	6.4±0.5	EI	5426
C₃H₉Pb⁺	(CH ₃) ₃ Pb (<i>tert</i> -C ₄ H ₉)(CH ₃) ₂ Pb ((CH ₃) ₃ Pb) ₂ C ₆ H ₅ SPb(CH ₃) ₃ (Plumbane, trimethyl(phenylthio)-)	75-74-1 32997-03-8 6713-83-3 40560-63-2	CH ₃ (CH ₃) ₃ C (CH ₃) ₃ Pb	8.77±0.16 8.67±0.21 9.02±0.14 8.37±0.1	EI EI EI EI	3548 3548 3548 4198
C₄H₁₂Pb⁺	(CH ₃) ₄ Pb	75-74-1	** ** **	8.50±0.04 8.83±0.1 8.26±0.17	PE PE EI	3880 3677 3548
C₇H₁₈Pb⁺	(<i>tert</i> -C ₄ H ₉)(CH ₃) ₃ Pb	32997-03-8	**	7.99±0.13	EI	3548
C₉H₁₄Pb⁺	C ₆ H ₅ (CH ₃) ₃ Pb (Plumbane, trimethylphenyl-)	19040-53-0	**	~8.82	PE	4589
C₁₀H₁₀Pb⁺	(C ₅ H ₅) ₂ Pb (Plumbocene)	1294-74-2	**	7.53±0.05 (V)	PE	4853
C₁₀H₁₆Pb⁺	C ₆ H ₅ CH ₂ (CH ₃) ₃ Pb (Plumbane, trimethyl(phenylmethyl)-)	54338-54-4	**	7.87±0.05	PE	4589
C₆H₁₈Pb₂⁺	((CH ₃) ₃ Pb) ₂	6713-83-3	**	7.41±0.10	EI	3548
C₄₄H₂₈N₄Pb⁺	C ₂₀ H ₈ N ₄ (C ₆ H ₅) ₄ Pb (Lead, [5,10,15,20-tetraphenyl-21H,23H-porphinato(2-)-N ²¹ ,N ²² ,N ²³ ,N ²⁴]- (SP-4-1)-)	14784-17-9	**	5.99±0.2	OTH	4962
OPb⁺	PbO	1317-36-8	**	9.08±0.10	EI	5163
O₂Pb⁺	PbO ₂	1309-60-0	**	8.87±0.10	EI	5163
C₁₄H₃₈Si₁Pb⁺	(CH(Si(CH ₃) ₃) ₂) ₂ Pb	41823-73-8	**	7.25±0.05 (V)	PE	4725
C₁₆H₄₄Si₁Pb⁺	((CH ₃) ₃ SiCH ₂) ₄ Pb	18547-13-2	**	8.14±0.1 (V)	PE	3830
C₁₄H₃₆N₂Si₂Pb⁺	(N(Si(CH ₃) ₃)(<i>tert</i> -C ₄ H ₉)) ₂ Pb	55147-79-0	** **	7.26±0.05 (V) 7.18 (V)	PE PE	4725 4157

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C₁₂H₃₆N₂Si₁Pb⁺	(N(Si(CH ₃) ₃) ₂) ₂ Pb	55147-59-6	**	7.92 (V)	PE	4157
				7.92±0.05 (V)	PE	4725
C₁H₁₂SPb⁺	(CH ₃) ₃ SCH ₃ Pb	14326-59-1	**	8.13±0.05 (V)	PE	4153
C₈H₁₁SPb⁺	C ₈ H ₅ SPb(CH ₃) ₃ (Plumbane, trimethyl(phenylthio)-)	40560-63-2	CH ₃	8.11±0.1	EI	4198
C₉H₁₁SPb⁺	C ₉ H ₅ S(CH ₃) ₃ Pb (Plumbane, trimethyl(phenylthio)-)	40560-63-2	**	8.15±0.05	PE	4589
				7.75±0.1	EI	4198
C₁₀H₁₆SPb⁺	C ₁₀ H ₁ (SCH ₃)(CH ₃) ₃ Pb (Plumbane, trimethyl[4-(methylthio)phenyl]-)	59163-57-4	**	<8.02 (V)	PE	4627
C₆H₁₈SPb₂⁺	((CH ₃) ₃ Pb) ₂ S	14511-33-2	**	7.78±0.05 (V)	PE	4153
Cl₂Pb⁺	PbCl ₂	7758-95-4	**	10.11 (V)	PE	3650
				(²D _{5/2})	PE	5035
				(²D _{3/2})	PE	5035
C₃H₉ClPb⁺	(CH ₃) ₃ PbCl	1520-78-1	**	9.70 (V)	PE	4566
Br₂Pb⁺	PbBr ₂	10031-22-8	**	9.81±0.05 (V)	PE	4826
				(²D _{5/2})	PE	5035
				(²D _{3/2})	PE	5035
C₃H₉BrPb⁺	(CH ₃) ₃ PbBr	6148-48-7	**	9.30 (V)	PE	4566
TePb⁺	TePh	1314-91-6	**	8.04 (V)	PE	4550
				(²Π _{1/2})	PE	4550
				(²Σ)	PE	4550
I₂Pb⁺	PbI ₂	10101-63-0	**	8.86±0.03	PI	3536
				(²D _{5/2})	PE	5035
				(²D _{3/2})	PE	5035
Bi⁺	Bi	7440-69-9	**	7.2±0.5	EI	4128
	Bi ₂	12187-12-1		9.6±0.5	EI	4128
Bi₂⁺	Bi ₂	12187-12-1	**	7.3±0.5	EI	4120
			**	7.6±0.5	EI	4128
Bi₃⁺	Bi ₃	XXXXX-XX-X	**	8.8±0.5	EI	4128
Bi₄⁺	Bi ₄	12595-65-2	**	7.3±0.5	EI	4128

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
LiBi⁺	BiLi	12048-27-0	**	6.0±0.5	EI	5426
C₃H₅Bi⁺	C ₃ H ₅ Bi (Bismin)	289-52-1	**	7.9	PE	4416
C₆H₅Bi⁺	(C ₆ H ₅) ₃ Bi (Bismuthine, triphenyl-)	603-33-8		7.75±0.1	PI	4325
C₁₂H₁₀Bi⁺	(C ₆ H ₅) ₃ Bi (Bismuthine, triphenyl-)	603-33-8		7.9±0.1	PI	4325
C₁₈H₁₅Bi⁺	(C ₆ H ₅) ₃ Bi (Bismuthine, triphenyl-)	603-33-8	**	7.45±0.05	PI	4325
F₃Bi⁺	BiF ₄	7787-61-3	**	~12	EI	3551
F₁Bi⁺	BiF ₅	7787-62-4		14.5-15	EI	3551
GaBi⁺	GaBi	12010-43-4	**	7±1	EI	3608
TlBi⁺	BiTl	26257-16-9	**	7.5±0.4	EI	3949
Ac⁺	Ac	7440-34-8	**	5.17±0.12	OTH	3875
Th⁺	Th	7440-29-1	**	6.11±0.02	PE	5052
(¹ S ₀)			**	12.22±0.07	PE	5052
(¹ P ₀)			**	12.56±0.06	PE	5052
(³ P ₀)			**	13.75±0.04	PE	5052
(³ P ₂)			**	15.49±0.03	PE	5052
(¹ P ₁)			**	5.9±0.15	EI	3962
			**	6.0±0.1	EI	4114
			**	6.2±0.2	EI	4123
			**	6.8	EI	4119
			**	6.9±0.5	EI	4909
			**	6.9±0.5	EI	5306
			**	7.0±0.5	EI	4208
			**	6.08±0.12	OTH	3875
			**	7.4±0.3	OTH	5149
			**	15.9±0.1	EI	4123
	ThO	12035-93-7	O	16	EI	4208
CTh⁺	CTh	12012-16-7	**	7.9±1.0	EI	5306
			**	8.0±1.0	EI	4112
C₂Th⁺	C ₂ Th	12071-31-7	**	6.4±0.5	EI	5306
			**	6.5±0.3	EI	4112
C₃Th⁺	C ₃ Th	XXXXX-XX-X	**	8.4±1.0	EI	5306

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
C_3Th^+	C_3Th	XXXXX-XX-X **		9.2 ± 1.0	EI	4112
C_7Th^+	C_7Th	52931-63-2	** **	9.0 ± 0.5 10.0 ± 1.0	EI EI	5306 4112
$C_{16}H_{16}Th^+$	$(C_8H_8)_2Th$ (Thorium, bis(η^8 -1,3,5,7-cyclooctatetraene)-)	12702-09-9	** **	6.75 (V) 6.79 (V)	PE PE	4562 4612
OTh^+	ThO	12035-93-7	** ** ** **	$\geq 6.0 \pm 0.1$ 6.1 ± 0.1 6.1 ± 0.15 6.1	EI EI EI EI	4208 4114 3962 4119
O_2Th^+	ThO_2	1314-20-1	** ** **	8.7 ± 0.15 8 ± 1 8.7 ± 0.15	EI EI EI	4114 4208 3962
$C_{20}H_{20}O_8Th^+$	$((CH_3CO)_2CH)_4Th$	17499-48-8	**	7.85 (V)	PE	5338
Cl_1Th^+	$ThCl_1$	10026-08-1	**	12.7 ± 0.3	EI	3795
$C_{15}H_{15}ClTh^+$	$(C_5H_5)_3ThCl$ (Thorium, chlorotris(η^5 -2,4-cyclopentadien-1-yl)-)	1284-82-8	**	7.85 (V)	PE	4585
$C_{18}H_{21}ClTh^+$	$(C_5H_5CH_3)_3ThCl$ (Thorium, chlorotris(1,2,3,4,5- η -1-methyl-2,4-cyclopentadien-1-yl)-)	62156-90-5	**	7.75 (V)	PE	4585
$RuTh^+$	$RuTh$	52014-55-8	** **	6.4 ± 0.5 7.1 ± 1.0	EI EI	4909 4130
$PtTh^+$	$ThPt$	12038-30-1	**	8 ± 2	EI	3968
Pa^+	Pa	7440-13-3	**	5.89 ± 0.12	OTH	3875
U^+	U	7440-61-1	** ** ** ** ** ** ** ** ** **	6.22 ± 0.5 6.0 ± 0.5 6.0 ± 0.5 6.1 ± 0.1 6.1 ± 0.3 6.8 ± 1.5 $\sim 6 \pm 0.5$ 6.05 ± 0.07 6.3 ± 0.3	S EI EI EI EI EI EI OTH OTH	3566 4909 5169 4114 3557 3595 3448 3875 5149
U^{+2}	U^+	15721-70-7	**	10.6 ± 1	S	3566

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$\text{H}_{16}\text{B}_1\text{U}^+$	$\text{U}(\text{BH})_4$	12523-77-2	**	9.58 ± 0.1 (V)	PE	4825
			**	$9.59 \pm$ (V)	PE	4888
			**	9.0 ± 0.5	EI	5375
CU^+	UC	12070-09-6	**	7.8 ± 1.0	EI	5169
C_2U^+	UC_2	12071-33-9	**	6.4 ± 0.5	EI	5169
C_3U^+	UC_3	XXXXX-XX-X	**	8.1 ± 1.0	EI	5169
C_1U^+	UC_1	XXXXX-XX-X	**	8.7 ± 0.5	EI	5169
$\text{C}_{16}\text{H}_{16}\text{U}^+$	$(\text{C}_6\text{H}_5)_2\text{U}$ (Uranium, bis(η^4 -1,3,5,7-cyclooctatetraene)-)	11079-26-8	**	6.15 (V)	PE	4562
			**	6.20 (V)	PE	4612
$\text{BC}_{18}\text{H}_{23}\text{U}^+$	$(\text{C}_7\text{H}_7\text{CH}_2)_3\text{UBH}_4$ (Uranium, tris[(1,2,3,4,5- η)-1-methyl-2,4-cyclopentadien-1-yl]-tetrahydroborate(1-))	62156-96-1	**	6.35 (V)	PE	4585
OU^+	UO	12035-97-1	**	4.3 ± 1.5	EI	3595
			**	5.6 ± 0.1	EI	4114
			**	5.7 ± 0.4	EI	3557
			**	$\sim 6 \pm 0.5$	EI	3448
O_2U^+	UO_2	1344-57-6	**	4.5 ± 1.5	EI	3595
			**	5.4 ± 0.1	EI	4114
			**	5.5 ± 0.4	EI	3557
O_3U^+	UO_3	1344-58-7	**	9.5 ± 1.5	EI	3595
			**	10.6 ± 0.1	EI	4114
			**	11.1 ± 0.4	EI	3557
$\text{C}_{16}\text{H}_{11}\text{O}_6\text{U}^+$	$((\text{CH}_3\text{CO})_2\text{CH})_2\text{UO}_2$	18039-69-5	**	8.40 (V)	PE	5338
$\text{C}_{20}\text{H}_{28}\text{O}_8\text{U}^+$	$((\text{CH}_3\text{CO})_2\text{CH})_4\text{U}$	17923-26-1	**	6.65 (V)	PE	5338
F_1U^+	UF_4	10049-14-6	**	9.51	PE	5371
			**	9.96 ± 0.1	EI	4865
			**	10.0 ± 0.3	EI	4865
	UF_6	7783-81-5	2F	17.35 ± 0.1	EI	4865
F_3U^+	UF_5	13775-07-0	**	11.28 ± 0.1	EI	4865
			**	11.5 ± 0.3	EI	4865
	UF_6	7783-81-5	F	14.24 ± 0.10	EI	4865
F_6U^+	UF_6	7783-81-5	**	14.00 ± 0.10	EI	4865

Table of Ion Energetics Measurements—Continued

Ion (state)	Reactant	CAS Registry Number	Other products	Ionization or appearance potential (eV)	Method	Ref.
$\text{C}_{10}\text{H}_2\text{O}_6\text{F}_{12}\text{U}^+$	$((\text{CF}_3\text{CO})_2\text{CH})_2\text{UO}_2$	67316-66-9	**	10.05 (V)	PE	5338
$\text{C}_{20}\text{H}_{16}\text{O}_8\text{F}_{12}\text{U}^+$	$(\text{CF}_3\text{COCHCOCH}_3)_4\text{U}$	32627-13-7	**	7.83 (V)	PE	5338
OSU^+	UOS	22201-28-1	**	$\sim 8 \pm 0.5$	EI	3448
Cl_1U^+	UCl_1	10026-10-5	**	9.18	PE	5371
			**	11.0 ± 0.3	EI	3795
$\text{C}_{15}\text{H}_{15}\text{ClU}^+$	$(\text{C}_5\text{H}_5)_3\text{UCl}$ (Uranium, chlorotris (η^5 -2,4-cyclopentadien-1-yl)-)	1284-81-7	**	6.90 (V)	PE	4585
$\text{C}_{18}\text{H}_{21}\text{ClU}^+$	$(\text{C}_5\text{H}_7\text{CH}_3)_3\text{UCl}$ (Uranium, chlorotris[(1,2,3,4,5- η)-1-methyl-2,4-cyclopentadien-1-yl]-)	59834-82-1	**	7.10 (V)	PE	4585
$\text{C}_{18}\text{H}_{21}\text{BrU}^+$	$(\text{C}_5\text{H}_7\text{CH}_3)_3\text{UBr}$ (Uranium, bromotris[(1,2,3,4,5- η)-1-methyl-2,4-cyclopentadien-1-yl]-)	62050-82-2	**	6.95 (V)	PE	4585
RuU^+	RuU	12316-41-5	**	6.1 ± 0.5	EI	4909
Np^+	Np	7439-99-8	**	6.1 ± 0.1	EI	4560
			**	6.20 ± 0.12	OTH	3875
			**	6.2657 ± 0.0005	S	5165
ONp^+	NpO	XXXXX-XX-X	**	5.7 ± 0.1	EI	4560
Pu^+	Pu	7440-07-5	**	6.06 ± 0.02	OTH	3875
Am^+	Am	7440-35-9	**	5.993 ± 0.010	OTH	3875
Cm^+	Cm	7440-51-9	**	6.09 ± 0.02	OTH	3875
Bk^+	Bk	7440-40-6	**	6.30 ± 0.09	OTH	3875
Cf^+	Cf	7440-71-3	**	6.41 ± 0.10	OTH	3875
Es^+	Es	7429-92-7	**	6.52 ± 0.10	OTH	3875
Fm^+	Fm	7440-72-4	**	6.64 ± 0.11	OTH	3875
Md^+	Md	7440-11-1	**	6.74 ± 0.12	OTH	3875
No^+	No	10028-14-5	**	6.84 ± 0.12	OTH	3875

Author Index

- Aarons, L. J., 4250
 Abbas, M. I., 4422
 Abbé, J.-C., 4052, 4311
 Abbey, L. E., 5337
 Abd-el-Mottaleb, S., 4600
 Abdulnur, S., 5093
 Abe, K., 4962
 Abouaf, R., 5195
 A'Campo, C., 5086
 Achiba, Y., 4076, 5214, 5262, 5318, 5383
 Ackermann, F., 3762
 Ackermann, R. J., 3795, 3962, 4061, 4114, 4560, 4624, 5275, 5342
 Adam, W., 4251, 5563
 Adamchuk, V. K., 3729
 Adams, G. P., 3570
 Adams, J. E., 4159
 Aerni, R. J., 3790
 Agashkin, O. V., 4996
 Aihara, J., 3877
 Ajello, J. M., 4757
 Ajò, D., 4983, 5189, 5243
 Akaba, R., 5486
 Åkermærk, B., 4269
 Akhmedova, F. N., 5586
 Akiyama, I., 5364, 5492, 5594
 Akopyan, M. E., 3752, 3766, 4025, 4078, 4086, 4192, 4266, 4353, 4959, 5135, 5514, 5515, 5543, 5557
 Albini, A., 4590
 Albridge, R. G., 4351, 5506
 Alder, R. W., 4419
 Alderdice, D. S., 4420, 4485
 Aldrich, H. S., 4215
 Alikhanyan, A. S., 5424, 5434, 5440
 Al-Khafaji, J. A., 5528
 Allan, M., 4391, 4460, 4540, 5432, 5575
 Allen, C. W., 5443
 Allen, G. C., 5371
 Allen, J. D., Jr., 3963, 4307, 4761, 4806, 4840, 4871, 4981, 5238, 5354
 Allison, D. A., 4750
 Almemark, M., 4269
 Aloisi, G. G., 3787, 4272, 4382
 Ames, D. L., 4561
 Ames, L. L., 4100
 Anastassiou, A. G., 4136, 4326, 4688
 Andersen, E. L., 4937
 Anderson, C. P., 3507, 3528
 Anderson, S. L., 5307
 Anderson III, G. M., 5567
 Andreocci, M. V., 4699, 4847, 5376, 5559
 Andrews, G. D., 5621
 Andrews, M. N., 3805
 Angelici, R. J., 5423
 Anicich, V., 5501
 Anthony, M. T., 4393
 Antonova, N. L., 4030
 Appel, R., 4827, 5207
 Appell, J., 3521, 3906, 5007, 5147, 5266
 Appelman, E. H., 3831, 3932, 4762, 5004
 Arbelot, M., 4253, 4439, 4555, 5410
 Armen, G. H., 5590
 Armentrout, P. B., 5375
 Armstrong, D. R., 3680
 Arnett, J. F., 4471, 4487, 4593, 5517
 Arnold, D. E. J., 4378, 4504, 4622
 Arnold, D. R., 5260
 Arriau, J., 5478
 Artemov, A. N., 3786
 Artyukhin, V. I., 4996
 Åsbrink, L., 3516, 3530, 3531, 3639, 3651, 3720, 3740, 3750, 4269, 4323, 4525, 4602, 5084, 5313, 5525
 Ashe, A. J., 3832
 Ashe III, A. J., 4374, 4416
 Ashmore, F. S., 4695
 Askani, R., 4034
 Aslanov, F. A., 5586
 Asmus, P., 4249, 4385, 4433, 4434, 5344
 Ast, T., 5141
 Astrup, E. E., 4380, 4549
 Audier, H. E., 3590, 5400
 Aue, D. H., 4480, 4497, 4527, 4990
 Avkhutsii, L. M., 4989
 Avni, R., 5149
 Azami, T., 5121
 Bach, R. D., 4084
 Bachhuber, H., 5248
 Back, R. A., 4896
 Backvall, J. E., 4269
 Baer, T., 4308, 4640, 5201, 5283, 5289, 5455
 Baerends, E. J., 4376
 Bafus, D. A., 3442, 4548
 Bagarat'yan, N. V., 4096
 Bain, A. D., 3826, 3843
 Bak, B., 4392
 Baker, A. D., 3520, 4218, 4418, 4965, 5190, 5590
 Baker, V. J., 5215
 Balducci, G., 3455, 3594, 3611, 3618, 4105, 4111, 5634
 Baldwin, J. E., 5621
 Baldwin, M. A., 4759, 4834, 5080, 5462
 Balkis, T., 4610
 Balle, T., 4510, 4537, 4614
 Bally, T., 4390, 4421, 4728, 5431
 Baluev, A. V., 5620
 Bancroft, G. M., 4822, 5300
 Baney, H. F., 5625
 Banna, M. S., 4415, 4970, 5534
 Bardi, G., 3986, 5229
 Barker, G. K., 4398
 Barlos, K., 5628
 Barnier, J.-P., 4963
 Barraclough, P., 5481
 Barrow, R. F., 4229
 Bartetzko, R., 4849, 5341
 Barton, T. J., 5216
 Barz, P., 3747
 Basch, H., 3643, 3649, 4738
 Basco, N., 3882
 Bass, V.-M., 5322
 Bassett, P. J., 3641, 4187
 Bassindale, A. R., 4139
 Basso-Bert, M., 4734
 Bastide, J., 4416, 4595, 4674, 4821
 Batich, C., 3832, 3999, 4049, 4189, 4251, 4263, 4396, 4569, 5281
 Batson, C. H., 5297, 5509
 Battaglia, A., 4719
 Batten, C. F., 4910, 4997
 Battiste, D. R., 4576
 Baumgärtel, H., 3930, 4350, 5079, 5196, 5270, 5352, 5399
 Bavia, M., 5456
 Bayer, H., 4432
 Baylis, A. B., 3441
 Bazhenov, B. A., 4058
 Beauchamp, J. L., 3632, 3633, 4124, 4152, 4165, 4342, 4679, 4722, 4868, 4898, 4899, 4907, 4921, 5003, 5042, 5375, 5458, 5501, 5516, 5616
 Becherer, J., 5335

Bechgaard, K., 4481
 Becker, G., 3844, 3867, 3950, 4160, 4584
 Beckhaus, H. –D., 5314, 5372
 Beerlage, M., 4523
 Beez, M., 3847
 Begtrup, M., 5309
 Begun, G. M., 3793
 Behan, J. M., 4573, 4621, 4739, 5499
 Bekki, K., 4830
 Bel'ferman, A. L., 3539, 3769, 4070, 5554
 Bell, S., 5465
 Bellachioma, G., 5559
 Bellamy, F., 5599
 Bel'skii, V. E., 5032
 Beltram, G. A., 4985, 5553
 Bénard, M., 5317
 Benezra, S. A., 3480, 3483, 3631
 Benito, I., 4097
 Bennett, S. L., 4131
 Benoit, F. M., 3792, 3973, 4831, 4850
 Bente, P. F., III., 3916
 Bentley, T. W., 3443, 3784, 4621
 Berger, H. –O., 5485
 Berger, J. G., 3994
 Bergman, R. G., 4374, 4779
 Bergmann, H., 4226, 4379
 Bergmark, T., 3529, 3645, 3725, 3728, 3911, 4351, 5060, 5506
 Berkosky, J. L., 4023, 5479
 Berkowitz, J., 3500, 3525, 3536, 3640, 3650, 3831, 3913, 3920, 3927, 3928, 3932, 3958, 3960, 3971, 4215, 4232, 4355, 4552, 4655, 4662, 4752, 4762, 4813, 4886, 4957, 4991, 4998, 5000, 5004, 5028, 5037, 5064, 5297, 5475, 5509
 Berlinsky, A. J., 4155
 Berman, D. W., 5501
 Bernardi, F., 4386, 4389, 4848
 Bernardini, A., 5228
 Bernauer, O., 4313, 5330
 Berry, A. D., 3814
 Berry, M., 5579
 Bert, G., 4698
 Bertorello, H. E., 3454
 Bertoti, I., 4517
 Bertrand, M., 3845
 Bethke, H., 3580
 Betteridge, D., 5190
 Bewick, A., 4735
 Beynon, J. H., 3845, 5141
 Bickelhaupt, F., 4262, 4515, 5436, 5630
 Bicker, R., 5377
 Bidinosti, D. R., 4598
 Biefeld, R. M., 5239
 Bieri, G., 3847, 4002, 4180, 4286, 4394, 4453, 4676, 4681, 4686, 4702, 4738, 4765, 5084, 5313, 5411, 5457, 5525
 Biernbaum, M., 4683
 Bigotto, A., 4854, 4889, 5095
 Bilgic, S., 5481
 Bimanand, A., 5099
 Binger, P., 5192
 Bischof, P., 3509, 3999, 4037, 4161, 4259, 4268, 4280, 4387, 4397, 4400, 4572, 4723, 4726, 5441, 5480, 5604, 5606, 5613
 Bitchev, P., 4847
 Bizot, M., 3945
 Blackburn, P. E., 3595
 Blair, A. S., 5268
 Blais, N. C., 5299, 5412
 Blake, A. J., 3672
 Blankespoor, R. L., 4851
 Bleckmann, P., 4296
 Bloch, A. N., 4481
 Bloch, M., 4740
 Block, T. F., 4683, 4692
 Bloodworth, A. J., 5563
 Bloomfield, J. J., 4593
 Bloor, J. E., 4806, 5354
 Bock, H., 3504, 3584, 3646, 3648, 3673, 3746, 3778, 3781, 3844, 3847, 3867, 3946, 3950, 4067, 4092, 4097, 4139, 4150, 4160, 4181, 4243, 4244, 4274, 4276, 4291, 4294, 4295, 4303, 4310, 4332, 4345, 4379, 4380, 4417, 4476, 4512, 4549, 4558, 4579, 4581, 4680, 4698, 4756, 4827, 4984, 5012, 5102, 5107, 5204, 5207, 5216, 5319, 5386, 5504, 5535, 5574, 5609, 5610, 5612, 5629, 5632
 Bodor, N., 4258, 4278, 4742, 4772, 4810
 Boekelheide, V., 3647, 3948, 4824, 5600
 Boggess, G. W., 3963
 Boggs, J. E., 4984
 Bogolyubov, G. M., 3674
 Bohlmann, F., 3996, 4041, 4044, 4046, 4051, 4300, 4336, 4346, 5429
 Böhm, M. C., 4832, 5108, 5194, 5281, 5373, 5384, 5392, 5447, 5599
 Bomse, D. S., 4459
 Bonapasta, A. A., 5285
 Bonati, F., 3497
 Bonnier, J. –M., 3588
 Borden, W. T., 5562
 Borossay, J., 3444, 4368, 4620
 Boschi, R. A., 3644, 3748, 3751, 3846, 3951, 3953, 3990, 4088, 4194, 4196, 4542, 5145
 Bossa, M., 5285
 Bosse, D., 5606
 Botter, R., 4003, 4482, 4567, 4684, 4943, 5626
 Bouchoux, G., 3590, 5608, 5611
 Bougeard, D., 4296
 Bowers, M. T., 4480, 4497, 4527, 4990, 5482
 Bowling, R. A., 4840, 5216, 5354
 Boxhoorn, G., 5539
 Boyd, R. J., 3828, 4449
 Boyd, R. K., 5200, 5290
 Božić, Z., 4690
 Bradshaw, D. I., 4625
 Brähler, G., 5612
 Brähler, U. G., 5204
 Branton, G. R., 3794
 Braunstein, C., 5590
 Breeze, A., 3666, 3680
 Brehm, B., 4381, 4630
 Breier, H., 5489
 Briegleb, G., 3577
 Brien, D. J., 5091, 5581
 Briggs, P. R., 3549
 Brint, P., 5090
 Brion, C. E., 3492, 4224, 5170
 Brisk, M. A., 4218, 4418
 Brito-Palma, F. M. S., 5215
 Brittain, H. G., 4384, 4965
 Brock, A., 4139
 Broer, W. J., 5058, 5316
 Brogli, F., 3532, 3638, 3668, 3780, 4002, 4019, 4039, 4040, 4048, 4063, 4374, 4531, 4740, 5034
 Brown, C. M., 4182, 4582, 4583, 5449, 5450, 5494, 5495, 5496, 5497, 5500
 Brown, P., 3446, 3447
 Brown, R. S., 4241, 4395, 4399, 4450, 4509, 4511, 4577, 4619, 4703, 4842, 4980, 5185, 5212, 5420
 Brown, S. A., 5290
 Browne, A. R., 5441
 Bruckmann, P., 3997, 4347, 4766, 5605, 5607
 Brundle, C. R., 3501, 3520, 3637, 3642, 3643, 3649, 3727, 3943, 4169, 4669
 Büchler, A., 3613

- Budenz, R., 4332
 Budnik, R. A., 4501
 Bulgin, D. K., 4597, 4685, 4944
 Bull, W. E., 3507
 Bunbury, D. L., 4844
 Bünzli, J. C., 3828, 3835, 3842, 3843, 4004, 4010, 4140, 4449, 4691, 4880
 Burak, A. J., 4010
 Burger, F., 4702, 5411
 Burgers, P. C., 5445
 Burgess, A. R., 4695
 Burgess, E. M., 5337
 Burns, G. T., 5216
 Burns, R. P., 5171
 Burroughs, P., 3979, 5148
 Bursey, M. M., 3480, 3483, 3496, 3631, 3805
 Bursten, B. E., 5024, 5191, 5565
 Buschek, J. M., 3887, 3889, 4134, 4137, 4141, 4156, 4214
 Buser, U., 4728
 Busse, B., 5153, 5330
 Bussièrès, N., 4693
 But, P. G., 4079
 Butlin, B. A., 5603
 Butkovskaya, N. I., 4920
 Butler, I. S., 5333
 Butler, J. J., 5283
 Butskii, V. D., 5424, 5434
 Buttrill, S. E., Jr., 4369, 4868
 Cabaud, B., 3574, 3745, 3956, 5428
 Caesar, G. P., 4778
 Camp, F. E., 4122
 Campbell, B. E., 3621
 Campbell, M. J., 4845
 Camus, P., 4060
 Cannington, P. H., 4704
 Cantone, B., 3453
 Cantú, A. M., 4312
 Caprace, G., 4633, 4829, 4979
 Caramella, P., 4719, 4954
 Cardaci, G., 4566, 5559
 Cardin, D. J., 3495
 Cardnell, P. C., 4759
 Carey, R. N., 3758
 Carlier, J., 4943, 5626
 Carlier, P., 4575, 5407, 5409
 Carlson, K. D., 3491
 Carlson, T. A., 3507, 3528, 3880, 4225
 Carmichael, P. J., 3654
 Carnovale, F., 4751, 4774, 4775, 4951, 5193, 5251, 5255, 5304, 5595
 Carolan, J. F., 4155
 Carusi, P., 4847
 Carver, J. C., 3507
 Caserio, M. C., 4124
 Cassol, A., 5338
 Cassoux, P., 4734
 Castle, P. M., 3820, 4122
 Cater, E. D., 3448, 4528, 4902
 Caletti, C., 4571, 4710, 4987, 5100, 5285, 5376, 5394, 5446, 5569
 Causley, G. C., 3970, 4697, 5183
 Cava, M. P., 4838
 Cavell, R. G., 4750
 Ceasar, G. P., 3873, 4008, 4167, 4431, 4782, 5474
 Cederbaum, L. S., 5269
 Cederlund, B., 4666, 4706
 Celotta, R. J., 5006
 Centineo, A., 4375
 Centineo, G., 3822
 Cerfontain, H., 4233
 Čermák, V., 3537, 5209
 Cetinkaya, B., 3512
 Ceyer, S. T., 5015, 5307
 Chadwick, D., 3517, 3659, 3667, 3694, 3879, 4220
 Chaghtai, M. S. Z., 3881
 Chang, C.-A., 3966
 Chang, J. C., 4609, 4820
 Chang, L., 5477
 Chang, Y.-M., 4429, 4719, 5099
 Chanon, M., 4253
 Chantry, P. J., 4607
 Chau, F. T., 4365, 4367, 4613, 5218
 Chen, B. H., 4258
 Cheng, K. L., 4524, 4649
 Cherednichenko, L. V., 4328
 Chernyaev, N. P., 5490
 Chervonny, A. D., 5587
 Chesnavich, W. J., 5482
 Cheung, A. S., 4430, 4445
 Chibrikov, V. M., 4079
 Chinone, A., 4348
 Chisholm, M. H., 5036
 Chiu, E., 4960
 Chiyoda, T., 5278
 Chizhov, Yu. V., 3658, 4078
 Chmutova, G. A., 5403
 Chondromatidis, G., 3580
 Christian, S. D., 3915
 Christie, J. R., 5025
 Christoph, G. G., 4832
 Chun, H.-U., 4287
 Chupka, W. A., 3525, 3920, 3927, 3932, 4355, 4655
 Chvalovsky, V., 4121, 4125
 Ciach, S., 3800, 3802
 Cihonski, J. L., 4167, 4431
 Ciliberto, E., 4585, 4983, 4987, 5103, 5168, 5203, 5206, 5217, 5243, 5250, 5568
 Clar, E., 4196, 4701, 4712, 4852
 Clark, D. T., 3832
 Clark, H. C., 4204
 Clark, J. B., 4697
 Clark, J. P., 4612, 4987
 Clark, M. S., Jr., 4968
 Clark, P. A., 3668, 4017
 Clark, R. J., 4456, 4720, 4753
 Clary, D. C., 4267
 Clegg, W., 5579
 Clements, P. J., 4618
 Coatsworth, L. L., 4822
 Cobley, U. T., 3832
 Cocke, D. L., 3440, 3597, 3798, 3966, 3978, 4120, 4206, 4529, 4532, 5331, 5635
 Cocksey, B. G., 3833
 Coffen, D. L., 4756
 Colbourn, E. A., 4755, 4760, 4883
 Colbourne, D., 4737, 4763, 5030, 5253, 5329
 Coleman, A. W., 4986, 4987
 Colin, R., 4183, 5223
 Collin, J. E., 3598, 3664, 3839, 4633, 4829
 Collins, G. A. D., 3666
 Collins, R. J., 3878
 Colonna, F. P., 4153, 4386, 4452, 4589, 4626, 4627, 4708, 4743, 4841, 4854, 4889, 5002, 5320, 5323
 Colton, R. J., 3938, 4022, 4188, 4278, 4500, 4647
 Compernelle, F., 4507, 4660
 Compton, R. N., 3793, 5274, 5430, 5622
 Conard, B. R., 4736
 Conde-Caprace, G., 3598
 Condorelli, G., 3822, 4375, 4427, 4562, 5338, 5568
 Conia, J.-M., 4963
 Connor, J. A., 4250, 4252, 4412, 5044, 5286

Connors, R. E., 4254
 Constantin, V., 4877, 5340, 5414
 Conway, J. G., 4264, 5056, 5165, 5186
 Cook, M. J., 4711
 Cooks, R. G., 3479, 3845, 5141, 5487
 Cooper, C. D., 5430
 Coppens, P., 4356, 4924, 4936, 5435
 Corderman, R. R., 4868
 Cornford, A. B., 3499, 3671, 3694
 Cosby, P. C., 5195
 Costa, M. L., 3779
 Costanzo, L. L., 5203, 5568
 Cotton, F. A., 5024, 5191, 5565
 Coughlin, D. J., 5212
 Coustale, M., 5478
 Cowan, D. O., 3518, 3660, 3936, 3981, 4481, 5373
 Cowan, R. D., 3566
 Cowley, A. H., 3825, 3872, 4185, 4191, 4261, 4371, 4705, 4942, 5036, 5191
 Cowling, S. A., 3824, 3988
 Cox, P. A., 3669
 Cradock, S., 3502, 3508, 3510, 3656, 3661, 3662, 3663, 3670, 3827, 4009, 4026, 4179, 4309, 4373, 4383, 4409, 4413, 4517, 4853, 5154
 Crandall, J. K., 4019, 4361
 Crasnier, F., 4734
 Cravey, W. E., 4952
 Creber, D. K., 4822, 5300
 Crowe, A., 3625, 3797, 3799, 4129
 Cruickshank, D. W. J., 3666, 3680
 Csákvári, B., 3444
 Cullen, W. R., 3589
 Cullison, D. A., 4083
 Cundy, C. S., 4077
 Cusachs, L. C., 3836, 3971, 4215, 4307, 4761, 4871
 Cuthill, A. M., 3796
 Cvitaš, T., 4690, 4727, 4890, 5151, 5352
 Czekalla, J., 3577
 Czira, G., 3939
 Daamen, H., 5139, 5213, 5539, 5540
 Dabard, R., 5448
 Dach, R., 5604
 Dacre, P. D., 4244
 Daisey, J. M., 3730
 Daly, N. R., 3445, 3452
 Damany, N., 5048
 Danby, C. J., 3833, 5041, 5066
 Danieli, R., 4198, 4627, 4848
 Danielson, P. M., 3595
 Dannacher, J., 4993, 5370, 5404, 5432
 Dargelos, A., 4650, 4814
 D'Arrigo, C., 5568
 Davidson, W. R., 4990
 Davis, L. P., 3848, 4576
 Davis, R., 5210
 Davis, S. P., 4264
 Day, J. S., 4809
 Dean, C. R. S., 4305
 Dean, F. M., 4573
 Debies, T. P., 3955, 4022, 4154, 4221, 4623, 5479
 DeBoer, Th. J., 4815
 DeCicco, G. J., 4938
 DeCorpo, J. J., 3442, 3814, 3952, 4870
 Deffner, U., 5379
 Deganello, G., 5206
 Degenhardt, C. R., 4855
 De Graaf, H., 4515
 De Greef, D., 4183, 5223
 Dehmer, J. L., 3640, 3831, 3958, 3960, 3971, 4215, 4670, 4749, 4885
 Dehmer, P. M., 3920, 4355, 4670, 4749, 4885, 5037
 Dehmlow, E. V., 5390
 Dehmlow, S. S., 5390
 de Jong, A. P., 5096, 5545
 DeKock, R. L., 3655, 3666, 3675, 3680, 4388, 4604
 Delaney, J. J., 5172
 De Lange, C. A., 4468, 4969, 5026, 5073, 5074, 5087, 5466
 De Leeuw, D. M., 5073, 5074, 5087, 5466
 Delgado-Pena, F., 5373
 de Liefde Meijer, H. J., 4428
 Delmas, M. A., 5369
 DeLoth, P., 4734
 Delwiche, J. P., 3664, 3839, 4414, 4633, 4829, 4961, 4979
 De Maria, G., 3594, 3611, 3618, 3949
 Dembech, P., 4386
 de Meijere, A., 3576, 3849, 4268, 4385, 4963, 5192, 5359, 5606
 Demuth, R., 5419
 Denisov, Yu. V., 3918, 4173
 Depière, D., 4102
 DeRoos, F. L., 4960
 Derrick, L. M. R., 5044
 Derrick, P. J., 4617, 5025, 5264
 Deschamps, J., 4403
 DeSchryver, F., 4660
 Desideri, A., 3608, 3986
 Detty, M. R., 4964
 Dewar, M. J. S., 3657, 3825, 3872, 4185, 4191, 4261, 4280, 4371, 4608, 4942
 Dewar, P. S., 4327
 Diamond, J., 5124
 Dibeler, V. H., 3921, 3929, 3931
 Dickson, R. S., 5255
 Dieck, H. t., 4181, 4584, 5442, 5523, 5529
 Diemann, E., 3838, 4632, 4639, 5333
 Dijkstra, G., 4228
 Dill, J. D., 4686
 Dillard, J. G., 4213, 4668
 DiLonardo, G., 3731
 Dimroth, K., 4053, 5271
 Dinerstein, R. J., 5472
 di Paolo, V., 5229
 Disch, R. L., 4384
 Distefano, G., 3497, 3498, 3804, 3806, 4145, 4153, 4198, 4368, 4377, 4386, 4389, 4452, 4589, 4620, 4626, 4627, 4664, 4708, 4743, 4841, 4848, 4854, 4889, 5002, 5013, 5095, 5292, 5320, 5323, 5564
 Dixit, M. N., 3560
 Dixon, D. A., 3633
 Dixon, R. N., 3665, 4420, 4485, 4602, 4770
 Dmitriev, A. B., 3729
 Dodonov, A. F., 4920
 Doecke, C. W., 5447, 5578
 Dolbier, W. J., Jr., 4833, Jr., 5246
 Dolby, L. J., 4586
 Domcke, W., 5269
 Domelsmith, L. N., 4651, 4654, 4667, 4672, 4758, 4803, 4819, 4833, 4855, 4866, 5099, 5246, 5567
 Donchi, K. F., 5025
 Donovan, R. J., 3567, 3742, 3878
 Dông, P., 3945
 Doran, M., 5172, 5536
 Dorko, E. A., 4184
 Dörr, F., 4334
 Doucet, J., 3749, 3914, 4246, 4321, 4366, 5470
 Dougherty, D., 4593, 4599, 4851, 5090, 5093, 5397, 5558
 Dougherty, R. C., 3454
 Douglas, J. E., 4990
 Downs, A. J., 4825, 4888, 5355
 Drake, J. E., 3511, 3514, 5261
 Dreckschmidt, R., 5548

- Dromey, R. G., 3834, 4193
 Drowart, J., 3458, 3557, 3819, 4001, 4098, 4102, 4356, 4486, 4678, 4682, 4874, 4901, 4924, 4936, 4966, 5435
 Drury-Lessard, C. R., 5071
 Dube, G., 4121, 4125, 5366, 5421
 Dubois, J. E., 4575
 Dudin, A. S., 4989
 Dudin, A. V., 5620
 Duffy, N. V., 4710
 Dufner, D. C., 5061
 Duke, Jr., R. E., 3848, R. E., 4357
 Duncan, W., 4309, 4383, 4853
 Dunlavey, S. J., 5011, 5222
 Dunmur, R. E., 5462
 Dürr, H., 5480
 Durup, J., 3906, 5007, 5147
 Duxbury, G., 3665, 4602
 Dyke, J. M., 4230, 4239, 4370, 4422, 4596, 4597, 4634, 4657, 4685, 4755, 4760, 4858, 4883, 4944, 5008, 5011, 5222, 5371, 5425
 Eaton, D. F., 4211, 4241
 Eaton, P. E., 4726
 Eberbach, W., 3853, 4040
 Ebsworth, E. A. V., 3502, 3661, 3670, 3827, 4026, 4373, 4409, 4413, 4504, 4517, 4988
 Eck, V., 4744
 Edqvist, O., 3516
 Edwards, C. J., 4735
 Edwards, J. G., 3449
 Edwards, L. O., 4144
 Efraty, A., 4661, 5423, 5561, 5576
 Egde, R. G., 4401, 4465, 4694, 4713, 4764, 4777, 4812, 4825, 4888, 5168, 5343, 5355
 Eggelte, H. J., 5563
 Eguchi, S., 4163
 Ehlert, T. C., 3623, 4745, 4873, 4875
 Eick, H. A., 3459, 3460, 3612, 3614, 3976
 Eidelsberg, M., 4237
 El-Abbady, S., 4711
 Eland, J. H. D., 3684, 3833, 3998, 4247, 4630, 4752, 4762, 4886, 4991, 5028, 5274
 Elbel, S., 4226, 4584, 5523, 5529
 Eley, D. D., 3829
 El-Gendy, M. A. F., 4117, 4677
 El-Kholy, S. B., 5513
 Ellingsen, P., 5502
 Ellis, B. E., 5290
 Ellison, F. O., 4023, 5479
 Ellison, G. B., 3727, 4669
 El'man, M. S., 3884, 4043, 5589
 El-Sayed, M. A., 5045
 Emma, V., 3453
 Emmel, R. H., 3823
 Enders, D., 5604
 Engel, P. S., 4429
 Engler, E. M., 5622
 English, A. M., 5333
 Enrione, R. E., 3540, 3547
 Ensslin, W., 3504, 4160, 4226, 4558, 4584, 4715
 Epstein, A. J., 4782
 Epstein, G., 3924
 Erden, I., 5563
 Ereš, D., 5242
 Erker, G., 4665
 Ermolaeva, L. V., 5021
 Ernstbrunner, E., 4327
 Ernsting, N. P., 5298
 Evans, K., 3876
 Evans, R., 5355
 Evans, S., 3527, 3669, 3676, 3677, 3681, 3682, 3683, 3686, 3688, 3830, 4132, 4166, 4234, 4492, 4826, 5148, 5507
 Evlasheva, T. I., 4173, 4325, 4328, 4592, 5040, 5552
 Eweg, J. K., 4992
 Fabian, B. D., 5358
 Fabian, D. J., 3796
 Fackerell, A., 4760, 4883
 Fadeeva, I. I., 4174
 Fagan, P. J., 5560
 Farber, M., 3462, 3463, 3465, 3606, 3617, 3620, 3801, 4054, 4113, 4506, 4881, 4894, 5166
 Farmer, J. S. H., 3492
 Fattahallah, G. H., 5256, 5257
 Faure, R., 4437
 Fayad, N. K., 4755, 4858, 5371
 Feather, D. H., 3613
 Fedorova, M. S., 3918, 4173
 Fehér, F., 4558
 Fehlnér, T. P., 3871, 4322, 4446, 4498, 4519, 4550, 4574, 4937, 4949, 4985, 5324, 5358, 5499, 5553, 5625
 Fehsenfeld, F. C., 5007, 5147
 Feil, D., 4523, 5530
 Felps, S., 3836
 Felps, W. S., 4653
 Fenderl, K., 3578, 3579, 5453
 Fenske, R. F., 3866, 4570, 4692, 4939, 5518
 Fenski, R. F., 4110
 Ferrari, R. P., 4116
 Ferraris, J. P., 3981, 4481
 Ferré, Y., 3587
 Ferreira, M. A. A., 3779, 3812
 Ferro, D., 5229
 Fetizon, M., 3590, 5400
 Finch, A., 4305
 Findlay, R. H., 3724, 4009, 4179, 5343, 5355
 Finkelbeiner, H. C., 3471, 3966
 Finkelstein, G., 4871
 Finney, C. D., 5503
 Finocchiaro, P., 5103
 Fischer, E. O., 3582
 Fischer, G., 5248
 Fischer, R. D., 3582, 4585
 Fishel, M. G., 4356
 Fishel, N. A., 3614
 Fjeldstad, P. E., 3977
 Flamini, A., 4427, 4566, 5559
 Flammang, R., 5487
 Flechtner, T. W., 4742, 4810
 Fleischhauer, J., 5265
 Fleming, G. R., 3665
 Flesch, G. D., 3628, 3791, 4546, 4714, 5291
 Flitsch, W., 5387
 Florida, D., 3773
 Flowers, M. C., 4610
 Fock, J.-H., 5167
 Foffani, A., 3498, 4198, 5292, 5564
 Foner, S. N., 3785, 4879, 4903, 4904
 Fonken, G. J., 4608
 Foos, J. S., 4189
 Forest, M., 4074
 Fort, R. C., Jr., 3886
 Fortin, C. J., 4018, 4074
 Foster, M. S., 3632, 4342
 Foster, R., 3543
 Foster, S., 3836
 Fournier, P., 5007, 5147
 Fragalà, I., 3822, 4375, 4562, 4585, 4777, 4983, 4987, 5103, 5134, 5168, 5189, 5203, 5206, 5217, 5243, 5317, 5338, 5560, 5568
 Franklin, J. L., 3442, 3487, 3490, 3808, 3987, 4548, 5016
 Franktseva, K. E., 5588

Franskin– Hubin, M.–J., 4829
 Franz, K.–D., 5193, 5595
 Franzen, H. F., 3449, 4202
 Freckmann, B., 5288, 5301
 Freiser, B. S., 4165, 5022
 Freund, R. S., 4558, 5126, 5617
 Frey, R., 4630, 4994, 5028, 5132
 Fridh, C., 3639, 3651, 3720, 3740, 3750, 4525
 Friege, H., 5202, 5310
 Fries, J. A., 4902
 Fringuelli, F., 3804, 3858, 4626
 Frintrop, P. C. M., 4228
 Fritz, G., 3844, 3855, 3867, 3950
 Fritz, H. P., 3747
 Frost, D. C., 3499, 3511, 3514, 3515, 3517, 3533, 3589, 3659, 3671, 3678, 3690, 3694, 3826, 3835, 3837, 3840, 3841, 3842, 3843, 3879, 3965, 4004, 4010, 4140, 4170, 4404, 4408, 4587, 4696, 4700, 4718, 4737, 4746, 4763, 4776, 4880, 5001, 5030, 5137, 5253, 5329, 5363, Frost
 Fu, P. P., 5364
 Fukui, K., 4769
 Furlani, A., 4847
 Furlani, C., 4571, 4699, 5100, 5376
 Furlani, C. L., 4710
 Fusina, L., 5456
 Fuss, W., 3584, 3673, 4243, 5609
 Gabdrakipov, V. Z., 4996
 Gacek, M., 5159
 Gadzhiev, M. M., 5586
 Gaidis, J. M., 3549
 Gaines, A. F., 4610
 Gaivoronskii, P. E., 3786, 5490
 Galasso, V., 4708, 4743, 4841, 4854, 4889, 5095
 Galatsis, P., 5290
 Galloni, G., 3731
 Galyer, L., 4733
 Gambino, O., 4116
 Gamble, A. A., 3484
 Gan, T. H., 4709, 4716, 4721, 4730, 4732, 4751, 4951, 5193, 5251, 5304, 5308, 5595
 Gandour, R. W., 4781, 4952
 Gardner, J. L., 3975, 4095, 4491, 4615, 4629
 Gardner, P. J., 4305
 Garner, C. D., 4999, 5579, 5596
 Gassman, P. G., 4955
 Gavin, R. M., Jr., 4235
 Gavrishchuk, E. M., 5490
 Gazizov, I. G., 5403
 Gellender, M., 4218
 Gelus, M., 3588
 George, J. K., 4357
 Gerson, S. H., 4742, 4772, 4810
 Gervais, D., 4734
 Gey, E., 5366, 5421
 Gfeller, J.–C., 3953
 Ghosh, S. N., 5136
 Gibbins, S. G., 4588
 Gibson, D. H., 5005, 5010
 Gibson, D. M., 3979
 Giessner, B. G., 3493
 Gigli, G., 3455, 3969, 4205, 4505, 5634
 Gilbert, J. R., 3484, 3788
 Gilbert, K. E., 5621
 Gilbert, R., 3764, 4271, 4321, 5470
 Gilbert, W. C., 4668
 Gil'burd, M. M., 3539, 3769, 4070, 5220, 5554
 Gilje, J. W., 4261
 Gilles, P. W., 3449, 4131
 Gilmore, J. R., 4327
 Gin, A., 5566
 Gingerich, K. A., 3440, 3468, 3469, 3471, 3472, 3473, 3596, 3597, 3609, 3619, 3621, 3798, 3961, 3966, 3968, 3978, 4012, 4120, 4130, 4206, 4209, 4518, 4529, 4532, 4869, 4900, 4909, 4919, 5061, 5150, 5169, 5303, 5306, 5331, 5349, 5391, 5426, 5635
 Ginter, M. L., 4182, 4582, 4583, 5449, 5450, 5494, 5495, 5496, 5497, 5500
 Giovannini, E., 4063
 Glavinčevski, B. M., 5261
 Gleiter, R., 3513, 3518, 3569, 3576, 3660, 3679, 3849, 3936, 3981, 4006, 4017, 4034, 4045, 4161, 4259, 4268, 4387, 4397, 4400, 4406, 4461, 4481, 4572, 4637, 4659, 4707, 4723, 4726, 4756, 4808, 4832, 4849, 4861, 4963, 4964, 5020, 5108, 5192, 5194, 5281, 5341, 5372, 5373, 5378, 5384, 5392, 5447, 5480, 5563, 5578, 5597, 5599, 5604, 5606, 5613
 Glemser, O., 3660, 3518
 Glenn, K. G., 3695, 3700
 Glockling, F., 3474, 3815
 Gmur, D. J., 5327
 Godfrey, M., 4327
 Goethals, P., 4183
 Goetz, H., 4297, 4333, 4340, 4341, 5417
 Goldstein, M. J., 3991, 4394, 4453
 Goldwhite, H., 4990
 Gole, J. L., 3743
 Goll, W., 4015
 Gollnick, K., 5311
 Golob, L., 3942, 4186, 4230, 4239, 4370
 Golovin, A. V., 5135
 Gompper, R., 3885
 Gonbeau, D., 4323, 4403
 Goode, N. C., 4419
 Goodman, D. W., 3657, 3825, 3872, 4185, 4191, 4261, 4280, 4371
 Goodman, G. L., 5297, 5509
 Goodman, T. D., 4307
 Gordon, S. M., 4320, 4922
 Gorgoraki, V. I., 5424, 5434, 5440
 Gorman, A. A., 3824
 Gorodyskii, V. A., 4174
 Gorokhov, L. N., 3821, 4556, 5620
 Gorzelska, K., 5261
 Gotchev, B., 4994, 5132
 Gotkis, I. S., 4556
 Gotthardt, H., 5341
 Gounelle, Y., 4003, 4482, 4567, 4684
 Gowenlock, B. G., 3654, 4465, 4809
 Gower, M., 4724
 Gräber, P., 3622
 Graefe, J., 5532
 Graeffe, G., 4549
 Grahn, W., 3994, 4779
 Granozzi, G., 4983, 5168, 5189, 5203, 5206, 5243, 5317
 Grasso, F., 3453
 Gravel, D., 4074
 Green, D. C., 5622
 Green, J., 4008
 Green, J. C., 3677, 3686, 3830, 4132, 4401, 4425, 4426, 4465, 4612, 4733, 4882, 4986, 4987, 5024, 5298, 5357, 5394, 5443, 5551, 5565
 Green, M. C., 3503
 Green, M. L. H., 3688, 4393, 5507
 Green, M. M., 4548
 Greenhough, T. J., 5348
 Greening, F. R., 5098
 Gregor, I. K., 5462
 Gregory, N. W., 3954
 Greiss, G., 3545
 Gress, M. E., 5439

- Grezzo, L. A., 5133
 Griebel, R., 4334
 Grim, S. O., 5438
 Grimaud, M., 5085
 Grimley, R. T., 3605, 4128, 4236
 Grimm, F. A., 3507, 3880
 Grindstaff, Q., 4236
 Groenenboom, C. J., 4428
 Gronneberg, T., 3635, 3636, 3891, 4178
 Gronowitz, S., 3858
 Grosjean, D., 3957
 Gross, M. L., 3544, 3735, 3790, 4960, 5083
 Grössl, M., 5176
 Grütmacher, H. F., 3552, 3553, 3583, 4302, 4337, 4359, 4925, 5230, 5401, 5459, 5493, 5570
 Guenot, P., 5448
 Guerra, M., 5002, 5323
 Guest, M. F., 3709, 4234, 4372, 4412, 4447, 4454, 4559, 4999, 5044, 5172, 5225, 5596
 Guido, M., 3455, 3594, 3611, 3618, 3969, 4105, 4205, 4505, 5634
 Guimon, C., 4253, 4323, 4402, 4403, 4405, 4407, 4410, 4439, 4555, 4711, 4995, 5215, 5224, 5228, 5309, 5389, 5410, 5415, 5478
 Guimon, M. F., 4402, 4405, 4410, 5415
 Gulamova, T. E., 5586
 Gunkel, E., 4285, 4767
 Gupta, K. A., 4909
 Gupta, S. K., 3450, 3451, 4900, 5061, 5150, 5169, 5306, 5391
 Gürtler, P., 5101, 5167
 Gur'yanova, E. N., 5040
 Gusarov, A. V., 3821, 4556
 Gusef'nikov, L. E., 5287
 Güsten, H., 4611, 4727, 4887, 5352, 5522, 5619
 Guthier, H., 3555
 Guyon, P. M., 3525, 4655
 Gygax, R., 4406
 Györösi, P., 3789, 4628
 Haaland, A., 5108
 Haas, A., 4345, 4512
 Haddad, G. N., 5127
 Haenel, M. W., 5575
 Hafner, K., 4572, 4828, 5613
 Hagan, L., 4210, 5081
 Hahn, R. C., 4866
 Hahn, Y. B., 4352
 Haider, R., 4963, 5335, 5597
 Haink, H. J., 4159
 Hall, D., 4821, 5211
 Hall, M. B., 3709, 4412, 4448, 5044, 5602
 Hall W. E., 5474
 Hamada, Y., 5623
 Hammer, C. A., 4761
 Hamnett, A., 3681, 3682, 4166, 5148
 Haney, M. A., 3487, 3490
 Hanrahan, R. J., 4553, 4862
 Hansen, P. E., 4863
 Hanson, A., 4072
 Hanson, B. E., 5191
 Hanson, G., 4586
 Haque, R., 5303, 5349
 Harada, Y., 4284, 4329, 5104
 Hardin, A. H., 4424
 Hargis, J. H., 5477
 Hariharan, A. V., 3459, 3612, 3614
 Harland, P. W., 4543, 5154
 Harman, P. J., 4716
 Harris, D., 5200
 Harris, D. H., 4157, 4725, 5321
 Harris, M. M., 3477
 Harrison, A. G., 4831, 4850, 5460, 5503
 Harshbarger, W. R., 4270
 Hartmann, H., 3738
 Hartmann, O.-R., 4287
 Harvey, G. A., 4922
 Harvey, R. G., 5364
 Haselbach, E., 3505, 3741, 3853, 3860, 3888, 4037, 4040, 4142, 4390, 4417, 4421, 4541, 4728, 5431
 Hashimoto, M., 4133, 4830
 Hashmall, J. A., 3936
 Hass, A., 3746
 Hassan, V., 3881
 Hauptmann, H., 4090
 Hawksworth, R. W., 4999, 5172
 Hayaisha, T., 4917
 Hayakawa, T., 3538
 Hayes, A. J., 4426, 4986
 Hazeldine, D. J., 3829
 Head, R. A., 4456, 4720, 4753
 Hedaya, E., 3476
 Heerma, W., 4228
 Heier, K.-H., 4066
 Heil, H. F., 3545
 Heilbronner, E., 3505, 3509, 3513, 3518, 3532, 3576, 3638, 3660, 3668, 3679, 3685, 3687, 3741, 3780, 3832, 3847, 3849, 3936, 3991, 3999, 4002, 4006, 4017, 4019, 4034, 4037, 4038, 4039, 4040, 4045, 4047, 4048, 4049, 4063, 4158, 4162, 4180, 4189, 4263, 4267, 4286, 4374, 4394, 4531, 4731, 4816, 4828, 5034, 5094, 5537
 Heimbach, P., 4380
 Hekman, M., 4045
 Helal, A. I., 5059
 Heller, C., 4142, 4338, 5314, 5325, 5335
 Heller, D., 3876
 Heller, R., 4335, 4358
 Hellwinkel, D., 4081
 Helm, H., 5176, 5350
 Hemmersbach, P., 4766, 5361
 Henion, J. D., 3817
 Henry, Y., 4684, 5400
 Hentrich, G., 4285
 Herberich, G. E., 3545
 Herbst, P., 5480
 Hernández, R., 4535, 5519
 Herring, F. G., 3499, 3511, 3514, 3671, 3678, 3693, 3694, 3837, 3879, 4880
 Herrmann, A., 4914, 5187
 Herrmann, R., 4346
 Hertzberg, M., 3634
 Herzberg, G., 3770
 Herzsuh, R., 5532
 Hess, B., 5374
 Heyman, M. L., 3828
 Hickling, R. D., 3488
 Higginson, B. R., 3655, 3680, 3870, 3979, 4132, 4187, 4233, 4252, 4372, 4425, 4447, 4492, 5044, 5225
 Highsmith, R. E., 3653
 Hildenbrand, D. L., 3610, 3616, 3816, 3818, 3909, 4123, 4208, 4436, 4483, 4544, 4554, 4580, 4860, 4864, 4865, 4872, 5067, 5468, 5471
 Hill, R. K., 4083
 Hill, W. E., 5362
 Hille, E., 4958, 5240
 Hillier, I. H., 3675, 3709, 4234, 4250, 4252, 4372, 4412, 4447, 4477, 4516, 4999, 5044, 5172, 5225, 5536, 5579, 5596
 Hilpert, K., 4458, 5296
 Hilton, P. R., 4430
 Hino, S., 4171, 4478
 Hintz, P. J., 3887
 Hirabayashi, T., 5610

Hirakawa, A. Y., 5623
 Hirayama, C., 3820, 4122
 Hirooka, T., 5307
 Hitchcock, A. P., 5170
 Ho, P., 5171
 Hoareau, A., 3745, 3956, 5428
 Hochmann, P., 5245
 Hodges, R. V., 5042, 5516
 Hoffman, M. K., 3805, 4115
 Hoffmann, R. W., 3933, 4094, 4363, 5335
 Höfler, K., 4381
 Hofmann, P., 4161, 4387, 5020
 Högberg, S., 3569
 Hohlneicher, G., 4334
 Höhne, G., 4292
 Hollinsed, W. C., 5133
 Holloway, J. H., 4998
 Holls, P. J., 4035
 Holmes, J. L., 3535, 4203, 4617, 4729, 4971, 5039, 5070, 5072, 5086, 5263, 5267, 5268, 5282, 5284, 5445, 5483
 Holmes, T. J., 4782
 Holsboer, F., 3885, 4024
 Holt, R. J., 4689
 Holtz, D., 3633
 Holzmann, G., 5488
 Hoobler, J. A., 4945
 Hopf, H., 4397, 5600
 Hoppilliard, Y., 5088
 Hörnfeldt, A.-B., 4666, 4673, 4706
 Hornung, V., 3513, 3569, 3679, 3685, 3832, 3936, 3991, 4034, 4040, 4048, 4162, 4765
 Horozoglu, G., 4965
 Horsley, J. A., 5266
 Hoshi, T., 3849, 4828
 Hoshino, H., 4033
 Hoskins, D. E., 5327
 Hosomi, A., 4241, 4457
 Hotop, H., 3541
 Houk, K. N., 3848, 4357, 4429, 4459, 4651, 4654, 4667, 4672, 4719, 4747, 4758, 4781, 4803, 4819, 4833, 4835, 4855, 4859, 4866, 4918, 4938, 4952, 4954, 5019, 5099, 5235, 5246, 5567
 Houle, F. A., 4722, 4898, 4899, 5042
 Houte, J. J. v., 3910
 Howe, I., 3479, 3916
 Hsia, M., 3623
 Hsieh, T.-C., 4862, 5388
 Huang, J.-T.J., 5479
 Huang, M. H. A., 4661, 5423, 5561, 5576
 Huard, D., 4905, 5027
 Huber, B. A., 5195
 Huher, J. R., 4159
 Huber, R., 3855
 Hubin-Franskin, M.-J., 4633, 4897, 4905, 4961, 4979, 5027
 Hühner, J., 3552, 3553, 3583
 Hudson, B. S., 5124
 Hudson, R. L., 3785, 4879, 4903, 4904
 Huehner, R. H., 5006
 Huffman, R. E., 3983, 5247
 Hugo, J. M. V., 3665
 Humski, K., 4690
 Hünig, S., 4461
 Huntress, W. T., Jr., 4757
 Hurum, T., 4117, 4178
 Husain, D., 3878
 Hush, N. S., 4430, 4445
 Hussain, M., 3725, 3728
 Hvistendahl, G., 3494, 3627, 3630, 3789, 4317, 4628, 5502
 Hwang, L.-S.J., 5358
 Ihle, H. R., 4568, 4912, 5188, 5334, 5393, 5426
 Ikeda, S., 3874, 3883, 4056, 4219, 5161
 Ikuta, S., 4056
 Il'in, M. K., 4096, 4663, 5585
 Iljin, M. K., 4663
 Imre, D., 4945, 5178
 Inghram, M. G., 4494, 5130, 5615
 Innorta, G., 3497, 3498, 3804, 3806, 3807, 4198, 4664, 5292, 5326, 5564
 Inokuchi, H., 3877, 4171, 4284, 4329, 4478, 5104
 Ipaktschi, J., 3780
 Ippolitov, E. G., 4989
 Irgolic, K. J., 4743
 Isakov, L. I., 5508
 Ishiguro, E., 4176, 4917
 Iskakov, L. I., 4028, 4031, 4057
 Islamov, R. G., 5328
 Iverson, A. A., 3774
 Ivko, A. A., 4071
 Iwai, T., 4068
 Jackson, J. R., 4922
 Jackson, S. E., 3686, 3830, 4132, 4425, 4987
 Jadrony, R., 4351, 4916, 5060, 5197, 5506
 Jalonen, J., 3481, 3803
 Jannitti, E., 4312
 Jansen, P., 4392
 Janssen, M. J., 5405
 Jaouen, G., 5448
 Jarnagin, R. C., 5455
 Jason, A. J., 5009, 5014, 5050
 Jaudon, P., 5038
 Jellinek, F., 4428
 Jenkin, J. G., 4837, 4845, 5054
 Jenkins, F. A., 3561
 Jennings, K. R., 3488
 Jennings, W. B., 5477
 Jewitt, B., 3688, 5507
 Jian-qi, W., 5315
 Jinno, M., 4056, 4219
 Joachim, P. J., 3677, 3683
 Jochims, H. W., 5079, 5196, 5270
 Johansen, R., 5108
 Johansson, S., 5233
 Johnson, C. A. F., 3654, 4809
 Johnson, I., 4578
 Johnson, K. M., 5041
 Johnson, L. P., 4503
 Johnson, R. P., 4866
 Johnstone, R. A. W., 3443, 3485, 3626, 3784, 3824, 3852, 3988, 4089, 4573, 4621, 4739, 5499
 Jois, S. S., 3560
 Jonas, A. E., 3880
 Jonathan, N., 3534, 3691, 3701, 3717, 3942, 4186, 4230, 4239, 4370, 4596, 4634, 4944, 5008, 5011, 5142, 5208, 5425
 Jones, D., 4854, 5002, 5323
 Jones, G. G., 4932
 Jones, G. R., 3501, 3642, 3943
 Jones, M., Jr., 5339
 Jones, R. W., 3869
 Jones, S. R., 4735
 Jones, T. B., 4280, 4608, 4726, 4731, 4738, 4740, 4816, 4846, 5094, 5537
 Jongsma, C., 5436
 Jonsson, B.-Ö., 3639, 3651, 3720, 3740, 3750, 5457
 Jonsson, M., 5313
 Jorgensen, F. S., 5395
 Jorgensen, W. L., 5562
 Judge, D. L., 3573, 5029
 Juds, H., 4297, 4333, 5417
 Jullien, J., 4567, 4684
 Jungen, Ch., 3770

- Junk, G. A., 3628
 Juslén, H., 4549
 Just, G., 5336
 Jutz, C., 4637
 Kagabu, S., 4281
 Kaim, W., 5012, 5102, 5319, 5332, 5382, 5504, 5535, 5574, 5629
 Kaizu, Y., 4029
 Kajitani, M., 5104
 Kalman, O. F., 5132
 Kamada, H., 4032, 4087, 5273
 Kaminski, J. J., 4278, 4742, 4772, 4810
 Kampars, V., 5591, 5592, 5593
 Kane-Maguire, L. A. P., 4724
 Kanter, H., 5271
 Kaposi, O., 4533, 4906
 Kardash, I. E., 4328, 5552
 Karlsson, L., 3529, 3645, 3725, 3728, 3911, 4351, 4916, 5060, 5197, 5506
 Kashparov, I. S., 4035
 Katayama, D. H., 3983
 Katihabwa, J., 4897
 Kato, H., 4163
 Katrib, A., 3511, 3514, 3515, 3659, 3678, 3694, 3837, 3864, 3879, 4022, 4220
 Katritzky, A. R., 4711, 5215
 Katsumata, S., 3862, 3984, 4068, 4076, 4513, 4514, 4547, 4768, 4773
 Kaufman, D. C., 4719, 5099
 Kaufman, F. B., 5622
 Kaufman, J. J., 4646
 Kaufman, V., 3754, 3756, 3974, 4175, 5081
 Kaupp, G., 4540
 Kaving, B., 4216
 Keehn, P. M., 5575
 Kelder, J., 4233
 Kelly, M. R., 5394
 Kelner, L., 5413
 Kemeny, P. C., 5127
 Kemp, N. R., 5190
 Kent, J. E., 4716
 Kent, M. E., 3476
 Kenyon, G. L., 4990
 Keppie, S. A., 3495
 Kessel, C. R., 5091, 5581
 Kessel, H., 5548
 Khalil, O. S., 3856
 Khandelwal, S. C., 4557
 Khmel'nitskii, R. A., 3767
 Kholodov, A. I., 4245
 Kibel, M. H., 4843
 Kilcast, D., 3832
 Killgoar, P. C., Jr., 3927
 Kim, Y. B., 5176
 Kimura, K., 3862, 3984, 4068, 4076, 4168, 4513, 4514, 4547, 4631, 4768, 5063, 5068, 5214, 5262, 5318, 5383
 King, C. E., 4743
 King, G. H., 3512, 3696, 3704, 3707, 5507
 King, G. W., 5098
 King, R. B., 5376
 King, T. J., 4419
 Kingcade, J. E., 5061
 Kingston, D. G. I., 3817
 Kinneberg, K. F., 3823
 Kira, M., 5102
 Kirby, C., 4857, 5363, 5541
 Kiriyama, T., 4163
 Kitaev, Y. N., 5589
 Kitaev, Yu. P., 3884, 4043, 4499, 5032, 5328, 5627
 Kitagawa, S., 5476
 Kitayama, J., 5273
 Klasinc, L., 4611, 4641, 4653, 4690, 4727, 4805, 4887, 4890, 5043, 5151, 5258, 5352, 5396, 5522, 5614, 5619
 Klebe, K. J., 3910
 Kleckner, J. E., 4679
 Kleemann, G., 4984
 Kleimenov, V. I., 3658
 Klein, F. S., 5149
 Klein, G., 5578
 Kleinschmidt, P. D., 5067
 Klessinger, M., 3713, 3997, 4249, 4285, 4347, 4385, 4433, 4434, 4665, 4766, 4767, 5310, 5344, 5361, 5605, 5607
 Kloster-Jensen, E., 4002, 4019, 4048, 4162, 4180, 4374, 4391, 4460, 4765, 4816, 5034
 Klots, C. E., 5622
 Kluge, G., 5258
 Klumpp, G. W., 4468
 Knauer, K. H., 5613
 Knight, M. J., 5596
 Knop, J. V., 4611, 4805, 5614
 Knowles, D. J., 3800, 4306
 Kobayashi, H., 4029
 Kobayashi, M., 4029, 4481, 4572, 4659, 4707, 4756
 Kobayashi, T., 3638, 3964, 4082, 4106, 4107, 4240, 4451, 4453, 4463, 4464, 4466, 4472, 4473, 4475, 4495, 4564, 4867, 4884, 4927, 5249, 5272, 5406, 5486, 5538
 Koch, E. E., 3857, 5101, 5167
 Koch, V. R., 3851
 Kochi, J. K., 4574, 4985, 5571
 Koenig, T., 3851, 4231, 4255, 4510, 4537, 4586, 4609, 4614, 4616, 4771, 4804, 4820, 4945, 5178
 Kohl, F. J., 3457, 3470, 4005, 4014, 4112, 4207
 Kojima, S., 5273
 Kokars, V., 5591
 Kollman, P. A., 4990, 5567
 Kollmeier, H. J., 3582
 Kolthammer, B. W. S., 5348
 Komina, T. V., 5403
 Kondo, T., 5318
 Konstantatos, J., 3742
 Koopman, H., 5353
 Kopp, I., 4229
 Köppel, C., 4300, 4336, 5429
 Kordis, J., 3596, 3798, 3961, 3978, 4012, 4120, 4529, 4532, 4869
 Kornfeld, R., 3916
 Kosbahn, W., 4024, 4493, 4748
 Koski, W. S., 3869, 4646
 Koto, M., 5273
 Kotov, B. V., 5505
 Kovač, B., 4887, 5043, 5396, 5463, 5575, 5600, 5619
 Kováč, P., 5227
 Kováčik, V., 5227
 Koyama, Y., 4118
 Kozlov, L. P., 4174
 Kraatz, U., 4434
 Kraessig, R., 3930, 4350
 Krapp, W., 4081
 Krause, D. A., 4939
 Krause, J. R., 4598, 5276
 Krebs, A., 4304, 4362, 5094
 Kreiberga, Y. N., 5593
 Kreiter, C. G., 3582
 Krenmayr, P., 3556, 4335, 4358
 Krier, C., 5173
 Krige, G. J., 4320
 Krishnamurthy, S. S., 3512, 3704
 Kronebusch, P. L., 5015, 5064
 Kroner, J., 3781, 4024, 4065, 4298, 4299, 4432, 4493, 4526, 4748, 5347, 5485
 Kroto, H. W., 3696, 3697, 3708, 3982, 4212, 4746, 4836, 4857, 5033, 5541

Ku, A. Y., 4835, 5235
 Kubach, C., 3521
 Kubota, T., 4470, 4551, 4674
 Kuck, D., 4925, 5230
 Kudrov, B. V., 4920
 Kuebler, N. A., 3637, 3643, 3649, 3727, 3941, 4036, 4084, 4270, 4669
 Kühn, Th., 4715
 Kukla, M. J., 4259, 5606
 Kunz, H., 5377
 Kunze, M., 5372
 Küpper, W., 5311
 Kupperman, A., 5125, 5232, 5408
 Kuppermann, A., 3739, 5017
 Kurashova, E. K., 5451
 Kurz, H. R., 4363, 5335
 Kuschel, H., 4337, 4359
 Kuthan, J., 4659
 Kutsev, V. S., 3456, 4030
 Kuyatt, C. E., 5006
 Kuzmenko, N. E., 3558
 Kuznetsova, L. A., 3558
 Kuzyakov, Yu. Ya., 3558
 Kwon, Y. S., 4418
 Labarre, J.-F., 4734
 Labinger, J. A., 5358
 Laerum, T., 5416
 Lageot, C., 3575, 3581, 3737
 Lagerqvist, A., 5049
 Lakshman, S. V. J., 3564
 Lakshmikantham, M. V., 4838
 Lampe, F. W., 4099
 Landis, M. E., 4780
 Landsberg, B. M., 4212
 Lang, D., 5202
 Lange, G., 5401
 Lantz, R., 4673, 4706
 Lanyiova, S., 3860, 4142, 4421
 Lappert, M. F., 3495, 3503, 3512, 3548, 3704, 4077, 4157, 4242, 4256, 4398, 4474, 4559, 4588, 4725, 5601
 Larichev, M. N., 4920
 Larin, N. V., 3786
 Larkins, J. T., 4075
 Larrabee, J. C., 5247
 Larson, D., 4471
 Larson, D. B., 4487
 Larzilliere, M., 5048
 Lassiter, T. W., 5238
 Lattman, M., 4222, 4536, 4705, 4942, 5036, 5191, 5438, 5526, 5566
 Lau, W. M., 5363
 Lauer, G., 4304, 4754, 5082
 Law, D., 5433
 Lawless, E. W., 3551
 Leach, W. P., 3788
 Leavell, S., 3987
 Leaver, D., 4812
 Lebert, K.-H., 3738, 4287
 LeBreton, P. R., 4369, 4644, 4868, 5003, 5364, 5472, 5492, 5594
 Leckey, R. C. G., 4837, 4845, 5054
 Leduc, G., 4360
 Lee, E., 4596, 4634
 Lee, E. P. F., 4950, 5052, 5172, 5257, 5433
 Lee, L. C., 5029
 Lee, L. K., 5492
 Lee, S. T., 3690, 3840, 3841, 3965, 4170, 4404, 4408, 4587, 4967, 5137
 Lee, T. H., 4022, 4023, 4248, 4278, 4455, 4500, 4647, 5473
 Lee, Y. T., 4923, 4926, 4930, 5015, 5307
 Leeder, W. R., 3589
 Lefaire, D., 5046
 Lefebvre-Brion, H., 3762
 LeGeyt, M. R., 4718
 Legzdins, P., 5348
 Leight, R. S., 4394, 4453
 Leipunskii, I. O., 4920
 Lemal, D. M., 4040
 Lempka, H. J., 3666, 3990
 Leng, F. J., 4931
 Lenich, F. T., 4397
 Lentz, D., 4984
 Leong, T. S., 5491
 Leroi, G. E., 3927
 Leupin, W., 5053
 Leutwyler, S., 4914, 5187
 Levenson, R. A., 4167, 4431
 Levsen, K., 5374
 Lewis, A. A., 4267
 Lewis, J., 5397
 Li, K. C., 5364, 5492
 Li, L. K., 5492
 Lichtenberger, D. I., 4110
 Lichtenberger, D. L., 3866, 4501, 4570, 5518
 Liebermann, R. W., 4122
 Liebman, D., 5423, 5576
 Liesegang, J., 4837, 4845, 5054
 Lightman, A. J., 5143
 Lightner, D. A., 3629
 Limouzin, Y., 4438, 5380
 Lin, J., 5492, 5594
 Lin, L.-N., 3915
 Lin, S. F., 4640
 Lin, S.-S., 4131
 Linda, P., 3482
 Lindberg, B., 3569
 Lindgren, B., 4216
 Lindholm, E., 3516, 3639, 3651, 3720, 3740, 3750
 Lindig, M., 5377
 Linn, S. H., 5439
 Lipton, M. S., 4394, 4453
 Lisin, A. F., 5021
 Little, D. J., 3742
 Litzow, M. R., 3495
 Liu, M. B., 4147
 Livett, M. K., 4774, 5544
 Lloyd, D. R., 3506, 3641, 3655, 3666, 3675, 3680, 3682, 3699, 3709, 3711, 3865, 3870, 3935, 3979, 4187, 4233, 4250, 4252, 4372, 4388, 4412, 4447, 4454, 4477, 4492, 4516, 4604, 4733, 4773, 4986, 5044, 5225
 Loch, R., 4318, 4897, 5051, 5205, 5346
 Loginov, M. V., 3526
 Loginov, Y. V., 5543
 Loginov, Yu. V., 3766, 4192
 Lohr, W., 5079, 5196, 5270
 Longmaid, H., 4255
 Lopatin, S. N., 4086, 4279, 4521, 4675, 4989, 5514, 5515, 5624, 5627
 Lossing, F. P., 3476, 3732, 4545, 4591, 4729, 4831, 4895, 4896, 4915, 5039, 5070, 5263, 5282, 5454, 5483
 Loudet, M., 5085
 Loudon, A. G., 3477, 4199, 4759, 4834, 4878, 5264, 5462
 Loutfy, R. O., 5491
 Louwen, J. N., 5536
 Lowden, L. F., 4873, 4875
 Lozac'h, N., 3569
 Luszyk, J., 5108, 5384
 Lynaugh, N., 3506, 3699, 3709, 3711, 4187, 4454
 Lynch, B. M., 4918
 Lynch, D. A., 3491
 Lyus, M. L., 4839, 5257

- Maccoll, A., 4834, 4895
 MacDiarmid, A. G., 3653, 3814, 4870
 MacDonald, B., 4776
 MacDonald, C. A., 5363
 MacDonald, C. B., 5001
 MacDowell, A. A., 4999, 5579, 5596
 MacLean, D. I., 4126
 MacNaughton, R. M., 4981
 MacNeil, K. A. G., 4770
 MacQuitty, J. J., 5601
 Maeda, K., 4118, 4197, 4876, 4911, 5128, 5129
 Mahan, B. H., 4923, 4926, 4930, 5015, 5307
 Maier, E., 4417
 Maier, G., 4293, 4361, 5094, 5107
 Maier, J. P., 3677, 3702, 3703, 3854, 3890, 4143, 4158, 4162, 4275, 4416, 4460, 4470, 4551, 4595, 4636, 4674, 4686, 4702, 4724, 4731, 4765, 4816, 4821, 4846, 5138, 5184, 5211, 5269, 5305, 5411, 5432, 5461, 5521, 5575
 Maire, J. C., 4438, 5369, 5380
 Majer, J. R., 3550
 Majeti, S., 3629
 Makarov, A. V., 5585, 5587
 Makowiecki, D. M., 3491
 Malaspina, L., 3947, 3949, 3986
 Maleev, A. N., 4245
 Malkerova, I. P., 5424, 5440
 Malmberg, C., 4229
 Malsch, K. D., 5094
 Maltsev, A. K., 3939
 Malyusov, V. A., 5440
 Mamantov, G., 3507
 Mancini, V., 3806, 3807
 Mangini, A., 4389
 Manne, R., 4310, 5198
 Mannschreck, A., 3505, 3888
 Manocha, A. S., 5034
 Manriquez, J. M., 5560
 Manuel, G., 3850, 3859, 4172, 4490, 5389, 5550
 Maquestiau, A., 5487
 Marcinko, R. W., 4703, 4842, 4980, 5420
 Marek, B. C., 3467
 Maretina, I. A., 3674
 Margrave, J. L., 3570, 3615, 3743, 4100, 5016
 Marino, G., 3482, 3804, 4626
 Märk, E., 5176
 Mark, F., 4590
 Märk, T. D., 4958, 5176, 5240, 5350
 Märkl, G., 4066, 4090
 Marks, T. J., 5560
 Marmet, P., 4693, 4905, 5027, 5046
 Marr, G. V., 3772
 Marschner, F., 4292, 4297, 4333, 4340, 4341, 4421, 5390, 5417, 5548
 Marsel, J., 4906
 Martens, J., 4062
 Marthaler, O., 5138, 5184, 5461, 5521
 Martin, H.-D., 3509, 3687, 4045, 4047, 4142, 4281, 4301, 4338, 5119, 5314, 5325, 5335, 5372
 Martin, W. C., 4210
 Martínez de Bertorello, M., 3454
 Martinho-Simoes, J. A., 5286
 Martinson, E., 5583, 5584
 Masclet, P., 3957, 4575, 5360, 5519
 Mason, D. C., 3739
 Masuko, H., 4917
 Mateescu, G. D., 3886, 3907
 Mathar, W., 3996, 4346
 Mathey, F., 4090, 4423, 4995, 5618
 Mathieu, G., 3812
 Mathur, B. P., 5143, 5337
 Matsumoto, A., 3538
 Matsumoto, H., 3712, 4076
 Matsumoto, M., 5318
 Matthews, J. L., 4972
 Mattice, W. L., 5517
 Mattson, G. A., 5477
 Mattsson, L., 4351, 4916, 5060, 5197, 5506
 Matyuk, V. M., 5437
 Mayer, B., 5314
 Mazengo, R. Z., 3477, 4199
 Mazerolles, P., 5389
 Mazzucato, U., 4377
 McAlduff, E. J., 4747, 4844, 4918, 4954, 5019, 5097
 McAllister, T., 3476
 McCabe, R. W., 5601
 McConkey, J. W., 3625, 3797, 3799, 4129
 McCulloh, K. E., 3925, 3931, 4807, 5009, 5146, 5454
 McDiarmid, R., 3565, 4238, 5199
 McDonnell, T. J., 5516
 McDowell, C. A., 3499, 3515, 3659, 3671, 3678, 3690, 3692, 3694, 3835, 3837, 3840, 3841, 3879, 3965, 4170, 4365, 4367, 4404, 4408, 4587, 4613, 4696, 4700, 4737, 4746, 4763, 4776, 4880, 5001, 5030, 5137, 5218, 5253, 5329, 5363
 McDowell, M. V., 3653, 3814, 3952
 McFarland, C. W., 3886
 McGee, H. A. Jr., 4522, 4689
 McGillivray, D., 3535
 McGlynn, S. P., 3836, 3856, 4462, 4471, 4487, 4520, 4593, 4599, 4648, 4653, 4851, 5090, 5093, 5245, 5397, 5517, 5549, 5558
 McGowan, J. C., 5290
 McNally, I. D., 4809
 McKee, M., 4942
 McKinnon, S., 5200
 McLafferty, F. W., 3916, 4223
 McLean, R. A. N., 3511, 3514, 3515, 3659, 3678, 3694, 3868, 3879
 McLean, W., 5455
 McLoughlin, R. G., 4928, 5120, 5293, 5345
 McMahon, T. B., 4124
 McMaster, B. N., 3784
 McMurtrie, A. C., 4871
 McNeil, D. W., 3476
 Mead, P. T., 5025
 Medynskii, G. S., 3658
 Meeks, J., 4599
 Meeks, J. L., 3856, 4462, 4471, 4487, 4520, 4648, 5549
 Meijere, A., 3849
 Meikle, G. D., 4409
 Meinema, H. A., 4228
 Meisels, G. G., 3493, 3823, 4910, 4997, 5388
 Mel'der, U. K., 5531
 Melinon, P., 5428
 Mellink, W. A., 5405
 Mellon, F. A., 3443, 3485, 3626, 3852, 4089
 Mellor, J. M., 4327, 4419, 4735
 Menard, C., 4482
 Meneghelli, B. J., 5324
 Menes, F., 4003, 4482, 4567, 4684
 Merimson, V. G., 3571
 Mertis, K., 4733
 Mertschen, B., 5453
 Mesnard, D., 5407
 Metras, F., 4402, 5085, 5415
 Meunier, P., 5356, 5422
 Meyer, L.-U., 4268, 4385
 Michels, G. D., 5291
 Mielczarek, S. R., 5006
 Miescher, E., 5144

Miginiac, L., 5407
Mihálov, V., 5227
Milazzo, P., 4167, 4431
Miletić, M., 5163, 5188, 5242
Millar, R. W., 4812
Millefiori, A., 5320
Millefiori, S., 5134, 5320
Miller, B. W., 4419
Miller, F., 4518
Miller, J. C., 5430
Miller, J. R., 3788
Miller, L. L., 3851, 4804
Mills, J. D., 5425
Mills, J. L., 4942
Mines, G. W., 3705, 3863, 4080, 4149, 4469
Minghetti, G., 3497
Mingos, D. M. P., 4882, 5357, 5547
Minnhagen, L., 3754, 3923
Minter, D. E., 4608
Mintz, D. M., 3739, 5408
Miroshnikov, A. I., 5279
Mitchell, K. A. R., 5295
Mitchum, R. K., 3823
Mittsev, M. A., 3526
Moberg, C., 4269
Mochida, K., 4985
Mock, W. L., 4324
Modelli, A., 4377, 4848, 5095, 5323, 5326
Mohanty, B. S., 5198
Mohmand, S., 5610
Mohraz, M., 5184, 5305, 5315, 5461, 5521, 5600
Moin, F. B., 3539, 3769
Molenaar–Langeveld, T. A., 4934
Mollère, P., 3844, 3867, 3950
Mollere, P. D., 3980, 4459, 4866
Momigny, J., 3812, 3839, 5051, 5173, 5205, 5346
Monaci, A., 5285
Montag, R. A., 4705, 5042
Mooyman, R., 5073, 5074, 5087, 5466
Moran, M. J., 4870
Moran, T. F., 5337
Moretto, H., 4373
Morgan, G. L., 5384
Morgan, R. P., 4617, 5264
Morioka, Y., 4176, 4917
Morishima, I., 3712, 4133, 4830, 5476
Moritani, I., 3759
Morland, D., 4267
Morozov, I. I., 4920
Morris, A., 3534, 3691, 3698, 3701, 3942, 4186, 4230, 4239, 4370, 4422, 4596, 4597, 4634, 4657, 4685, 4755, 4760, 4858, 4883, 4944, 5008, 5011, 5142, 5208, 5222, 5371, 5425
Morrison, J. D., 3811, 3813, 3834, 3967, 4503, 4928, 5293
Morrison, R. J., 3815
Morse, R. D., 3882
Morton, T. H., 4459
Moseley, J. T., 5195
Moule, D. C., 5071
Mouvier, G., 3957, 4535, 4575, 5360, 5407, 5409, 5519
Moyes, R. B., 4625
Moyes, W., 4891, 4892, 4893, 5259
Muenow, D. W., 3615, 3810, 4200
Mui, T. C., 4806
Muiry, I. B., 4413
Mukherjee, D., 5099
Müller, A., 3838, 4632, 5333
Müller, B., 5429
Müller, C., 3993, 4304, 4324, 4326, 4508, 4638, 4779, 4838, 4856, 5444
Müller, E., 4400
Müller, F., 4992
Müller, G., 4423
Müller, J., 3545, 3578, 3579, 3582, 4015, 5453
Muller, J.-F., 4275, 4435, 4470, 4551
Müller, R., 5488
Munchausen, L. L., 4667, 4672, 4719, 4859
Munir, Z. A., 3475
Murad, E., 4123, 4208, 4483, 5468
Murata, I., 4637, 5597
Murdoch, J. D., 3670
Murphy, C. B., 3547
Murphy, Jr., C. B., 3540
Murphy, M. K., 4907
Murray, P. T., 5455
Murrell, J. N., 3644, 3707, 3710, 3948, 4267
Musaev, I. A., 5451
Musso, H., 3741, 4034, 4726
Muszkat, K. A., 4038
Muthard, J. L., 4832, 4849
Müürisepp, M., 5584
Myers, C. E., 3458, 3819, 4001, 4678
Nagakura, S., 3964, 4076, 4082, 4106, 4107, 4240, 4466, 4472, 4473, 4475, 4495, 4564, 4867, 5249, 5272, 5406
Nagaraj, S., 3560
Nagata, S., 4769
Nagy–Felsobuki, E., 4741, 4775, 4947, 4948, 5023, 5031, 5544
Nakagaki, R., 5406
Nakajima, T., 4917
Nakamura, M., 4176, 4917
Nakasujii, K., 4637
Nakato, Y., 4962, 5277, 5278
Nametkin, N. S., 5287
Naoumidis, A., 4458
Narayan, B., 3755
Narayana, B., 3761
Natalis, P., 3664, 3839, 4073, 4633, 4829, 4979
Natowsky, S., 3991
Nauman, R. V., 3848, 4576, 5397
Neckel, A., 3775
Nefedov, O. M., 3939
Neijzen, B. J. M., 4468, 4969, 5026
Neilands, O., 5591, 5592, 5593
Nelsen, S. F., 3887, 3889, 4134, 4137, 4141, 4156, 4214, 4780, 5091, 5133, 5280, 5581
Neubert, A., 4119, 5294, 5426
Neubold, H. B., 4135
Neunhoeffler, H., 4707
Newkome, G. R., 3848, 4593, 5517
Ng, C. Y., 4923, 4926, 4930, 5015, 5307, 5439
Ng, T. L., 5465
Nibbering, N. M. M., 4934, 5083
Nicholson, A. J. C., 3524, 3800, 3802, 4306
Nicholson, D. G., 4146
Nicholson, J. A., 4837
Nicoletti, R., 3629
Nicotra, G., 5569
Niedenzu, K., 4298
Niehaus, A., 3541
Nielsen, P., 4782
Nielsen, U., 5182
Niendorf, K., 4279
Nieuwpoort, W. C., 5058
Nihei, Y., 4032, 4087, 5273
Nikitin, O. T., 4096, 4663, 5585, 5587
Nikolaev, E. N., 4108
Nisbet, J. D., 4812
Nishida, S., 3759
Nishimura, T., 5174
Niwa, Y., 4986, 5174

- Nixon, J. F., 4021, 4456, 4720, 4753, 4836, 5033, 5327
 Nölle, D., 4065, 4299, 4526
 Nomoto, K., 5262, 5318, 5383
 Noodleman, L., 5295
 Norman, J. G., Jr., 5327
 Nöth, H., 4065, 4298, 4299, 4526, 5485, 5504, 5628
 Nounou, P., 3574, 3588, 3745, 3956
 Novadj, I., 4727
 Novak, I., 4805, 5258
 Nozoye, H., 5174
 Nugent, W. A., 4574
 Nutakul, W., 4952
 Nyberg, G. L., 4843, 4931
 Nygaard, K. J., 4352
 Obenland, S., 4488
 Oberhammer, H., 4984
 O'Bryan, C. L., 3983
 Oehling, H., 3934
 Oertel, H., 5399
 Ogata, H., 4032, 4087, 5273, 5623
 Ogawa, M., 3573, 3760, 5029
 Ogawa, S., 3760
 Ohno, K., 4284
 Ohta, M., 4348
 Ojo, I. A., 5210
 Okabe, H., 3929
 Okuda, M., 3691, 3701, 3714, 3942, 4186, 4230, 4239, 5142, 5208
 Okudaira, S., 3486
 Olavesen, C., 3550
 Olfký, R. S., 3634
 Olivier, J. L., 5205
 Olsen, H., 4691
 O'Neill, S. J., 4956
 Ong, T. -S., 5005, 5010
 Ongstad, L., 5159
 Onizuka, H., 4032, 4087
 Ono, Y., 5439
 Opendak, I. G., 4108
 Orchard, A. F., 3527, 3669, 3677, 3681, 3682, 3683, 3688, 3979,
 4166, 4234, 4492, 4694, 4713, 4764, 4777, 4825,
 4826, 4888, 5148, 5507
 Orders, P. J., 5054
 Oren, D., 5413
 Orlandi, G., 4377
 Orlov, V. M., 5279
 Osafune, K., 3862, 4168, 4514, 5063, 5068
 Osawa, H., 5102
 Osborne, A. D., 4971
 Oskam, A., 4376, 4428, 4908, 4946, 4992, 5139, 5213, 5536, 5539,
 5540
 Otto, A., 3857
 Oudshoorn, Ch., 4376
 Overman, L. E., 4803
 Owzarski, T. P., 4202
 Ozaki, M., 5277
 Özgen, G., 4610
 Özgen, I. T., 4610
 Pabst, R. E., 5016
 Paddock, N. L., 4718
 Padolina, M. C., 4185, 4191
 Padvá, A., 4644, 5472
 Paetzold, R., 4279, 4600
 Pagni, R. M., 5597
 Paguette, L. A., 4964, 5235
 Paine, A. J., 4929
 Paine, R. T., 3652
 Paisner, J. A., 5056, 5186
 Paldoia, P., 5556
 Palenius, H. P., 5247
 Palmer, M. H., 3724, 4009, 4179, 4812, 4891, 4892, 4893, 5259,
 5343, 5355, 5577
 Palmer, T. F., 3829
 Panchenkov, I. G., 3821
 Pappalardo, G. C., 4743, 4854, 4889
 Paquette, L. A., 4006, 4008, 4259, 4723, 4832, 4835, 4849, 4855,
 5019, 5441, 5447, 5578, 5599, 5606
 Parker, D. H., 5045
 Parmelee, W. P., 5133
 Parr, A. C., 4807, 5009, 5014, 5050, 5181
 Parr, G. R., 4069, 4349
 Pasanen, P., 3803
 Pasto, D. J., 5625
 Patel, R. C., 5215
 Pattje, W. R., 4901
 Pattoret, A., 3557
 Paule, R. C., 4687
 Paulus, J.-M., 4052, 4311
 Payling, D. W., 4305
 Peacock, V. E., 4780 5280
 Peatman, W. B., 4994, 5132
 Pechine, J. M., 4003, 4482
 Pedley, J. B., 3503, 3512, 3548, 3704, 4077, 4242, 4256, 4398,
 4474, 4559, 4588, 4725, 5481
 Peel, J. B., 3834, 4193, 4484, 4489, 4635, 4709, 4716, 4721, 4730,
 4732, 4741, 4751, 4774, 4775, 4818, 4837, 4947,
 4948, 4951, 5023, 5031, 5193, 5251, 5255, 5304,
 5308, 5469, 5544, 5595
 Peeters, H., 5387
 Pelino, M., 5150, 5303
 Peng, S., 4644, 5492, 5594
 Pervov, V. S., 5424, 5434, 5440
 Pesterev, V. I., 4996
 Peters E. M., 4984
 Petersen, R. D., 5484
 Petrosky, V. E., 4288
 Petrov, A. A., 3674, 3767
 Pettsol'd, R., 4086, 5514, 5624
 Pfab, J., 4465, 4809, 5298
 Pfeffer, H.-U., 4665
 Pfister-Guillouzo, G., 4253, 4323, 4402, 4403, 4405, 4407, 4410,
 4439, 4555, 4711, 4995, 5085, 5215, 5228 5309, 5356,
 5389, 5410, 5415, 5422, 5478
 Pflieger, K. H., 4512
 Pföhler, P., 5119
 Phillips, G. R., 4603
 Piacente, V., 3472, 3594, 3608, 3609, 3947, 3949, 3986, 4111,
 4919, 5229
 Piancastelli, M. N., 5569
 Piedrahita, C., 4833, 5246
 Pietropaolo, D., 4153, 4589, 4664
 Pignataro, S., 3482, 3497, 3498, 3787, 3804, 3806, 3807, 4145,
 4153, 4368, 4377, 4389, 4452, 4589, 4620, 4626,
 5013, 5292, 5320
 Pihlaja, K., 3481, 3803
 Pikver, R. I., 5531
 Pilet, O., 5315
 Pinchas, S., 5506
 Pincock, R. E., 3492
 Pinkerton, F. H., 3685
 Pirnazarova, F. N., 4079
 Piruzyan, L. A., 4079
 Pitacco, G., 4452
 Pitt, C. G., 3546, 3758, 3922, 3946
 Pittermann, U., 5177
 Planckaert, A. A., 4246
 Plantenga, F. L., 4530, 4658
 Platenkamp, R. J., 5577
 Plessner, T., 4296
 Plotnikov, V. F., 3674
 Plowman, K. R., 5333

Plum, H., 5265
Pocklington, J., 5094
Pohle, H., 5417
Pokorny, D., 4960
Pollak, H., 4994, 5132
Poltorakov, A. P., 4079
Polyakova, A. A., 3767
Pong, W., 4606
Ponomarev, D. A., 5557
Poole, R. T., 4837, 4845, 5054
Popkie, H. E., 4646
Pople, J. A., 5034
Popović, A., 4906
Poppek, R., 5489
Porter, R. F., 3461, 3464
Potapov, V. K., 3523, 3918, 4028, 4031, 4055, 4057, 4058, 4173, 4325, 4328, 4592, 5040, 5437, 5505, 5508, 5512, 5552
Pottier, R., 4814
Potts, A. W., 3695, 3700, 3716, 3719, 4344, 4642, 4643, 4817, 4839, 4950, 5035, 5052, 5055, 5172, 5256, 5257, 5433
Potzinger, P., 5276, 5311
Pouzard, G., 4696
Powell, P., 5394, 5551
Powell, R. E., 3452
Powis, I., 5041, 5066, 5175
Pozdnyakov, V. P., 4174
Pozharskii, A. F., 4035
Praefcke, K., 4062, 4292
Praet, M. –Th., 3585, 4414, 4633, 4829, 4961
Prange, T., 5400
Pravednikov, A. N., 4328
Preiss, H., 3783, 4339
Pressley, G. A., Jr., 3441
Prest, H. F., 5439
Preston, J. A., 3625
Price, S. J. W., 4127, 5252
Price, W. C., 3695, 3700, 3716, 3719, 3761, 4344, 5035
Prins, I., 4815
Prinzbach, H., 3509, 4740, 5463
Prokhoda, A. L., 5437
Prudnikova, G. V., 3729
Pua, C. K. N., 3794
Puchkova, V. V., 5040
Puddephatt, R. J., 4739
Pullen, B. P., 4645
Pupp, C., 3473, 3621
Pusatcioglu, S., 4522
Puttemans, J.–P., 4072, 4319
Pye, P. L., 5601
Pygall, C. F., 3688
Pykhtina, E. V., 4328
Quinn, C. B., 4569
Rabalais, J. W., 3529, 3530, 3645, 3721, 3725, 3728, 3864, 3911, 3938, 3955, 4022, 4023, 4154, 4188, 4221, 4248, 4278, 4455, 4500, 4602, 4623, 4647, 5473, 5479
Rabeneck, H., 4013
Rademacher, P., 4085, 4146, 4277, 5288, 5301, 5322, 5353, 5381, 5387, 5489
Radler, K., 3857, 5000
Radom, L., 5034
Radwan, T. N., 4539
Radziemski, L. J., 3756, Jr., 3566, Jr., 4175
Rake, A. T., 4204
Rakita, P. E., 3805
Ramler, J., 5176
Ramsey, B. G., 4139, 4956, 5092, 5527
Rang, S., 5556, 5583, 5584
Rankin, D. W. H., 3662, 4373, 4378, 4409, 4504, 4543, 4622, 4988, 5398
Rao, C. N. R., 4401, 4465, 4467
Rao, T. V. R., 3564
Ratkovskii, I. A., 5603
Rauh, E. G., 3448, 3795, 3962, 4061, 4114, 4560, 4624, 5275, 5342
Ravishankara, A. R., 4553
Rayermann, P., 4757
Raymonda, J. W., 3559, 3757, 4144
Raznikov, V. V., 4920
Reader, J., 3924, 4210, 5179, 5180
Recca, A., 5103, 5134
Reck, G. P., 5143
Redhead, P. A., 3489
Recher, J. R., 4714
Reetz, M. T., 4094
Reid, D. H., 4406
Reid, N. W., 4320
Reineke, W., 5365
Reingold, I. D., 4824
Reinke, D., 3930, 4350, 5352
Reiss, J. A., 5575
Reiter, F., 5341
Remane, H., 5532
Renhorn, I., 5049
Rennekamp, M. E., 3845
Rettig, W., 4935
Reuss, G., 3577
Reynaert, J. C., 4936, 5435
Ricci, A., 4153, 4198, 4589, 4627, 4664, 4848
Rice, S. A., 3773, 3876, 4184, 4235
Richardson, N. V., 3669, 4411, 5148
Richter, W., 5368
Ridyard, J. N. A., 3990, 4891, 4892, 4893, 5124, 5472
Riedel, M., 4533
Rieker, A., 4808
Riley, J. D., 4845
Riley, P. I., 5601
Rinke, K., 4013
Ritter, A., 5276
Robb, J. C., 3550
Roberge, R., 4972
Robert, P., 4236
Roberts, J. A., Jr., 3607
Roberts, P., 4265
Roberts, P. J., 3669, 3865, 3870, 4187, 4454, 4477, 4516, 4604
Robertson, A., 3827
Robin, M. B., 3637, 3643, 3649, 3727, 3941, 4084, 4270
Roche, A. L., 3762
Rodionov, A. N., 4055, 4325
Roebber, J. L., 4254, 4557
Rogers, A. J., 5481
Rogerson, P. F., 3496
Rogozhin, K. L., 4055, 4325
Rohwer, H. E., 5012, 5574
Römel, J., 5298
Rommel, E., 4189
Roos, B., 4269
Rosenberg, R. A., 4967
Rosenstock, H. M., 4075, 5106, 5181, 5454
Rosmus, P., 4092, 4150, 4244, 4476, 4680, 4698, 5107, 5211, 5386
Ross, K. J., 3534, 3691, 3942, 4186, 5142, 5208
Rossi, M., 3860, 4421, 4541
Roth, W. R., 4665
Rothe, E. W., 5143
Rothgery, E. F., 4522, 4689
Rothkopf, H. W., 5488
Rousseau, Y., 4018, 4074, 4360
Roy, D., 4979
Rozeboom, M. D., 4835, 5235
Rücker, C., 5202
Rudolph, R. W., 5324

- Ruge, B., 5480
 Runge, W., 4493, 4748
 Rušćić, B., 5522, 5619
 Russ, B., 4041
 Russell, B. R., 3774, 3776, 3970, 4144, 4697, 5123, 5183
 Russell, D. H., 5083
 Russell, M. E., 4603, 5467
 Rye, R. T. B., 5072, 5267
 Saalfeld, F. E., 3634, 3653, 3814, 3952, 4870
 Sacher, R. E., 4126
 Sadka, S., 4418
 Sadvovskaya, V. L., 3571
 Sahini, V. E., 4877, 5340, 5414
 Saile, V., 5101
 Saito, M., 4201
 Sakito, Y., 4163
 Sakurai, H., 5102
 Salahub, D. R., 3748, 3751, 4194, 4542, 5145
 Sale, F. R., 4618
 Salisbury, K., 4289
 Salmona, G., 3587, 4437
 Salomon, R. G., 5212
 Saltsburg, H., 4778
 Samson, J. A. R., 3975, 4095, 4288, 4491, 4615, 4629, 5127
 Sánchez, G. R., 4533
 Sandhu, J. S., 3533
 Sandman, D. J., 4782
 Sandorfy, C., 3749, 3764, 3914, 4246, 4271, 4321, 4366, 4424, 4650, 4814, 4972, 5470
 Sandström, J., 4323
 Santiago, C., 4781, 4938, 4952, 5019, 5235
 Santini, S., 4272, 4382
 Santoro, E., 3989
 Sapiano, H. J., 4127
 Sarapu, A. C., 3866
 Sasaki, T., 4163
 Sasanuma, M., 4176, 4917
 Sato, N., 5104, 5476
 Sauer, J., 4291, 5202
 Saunders, V. R., 3675
 Sauvageau, P., 3749, 3764, 3914, 4321, 4366, 5470
 Savage, W. J., 3661, 3663
 Savelli, G., 4382
 Saxon, R. P., 5195
 Sayrac, T., 4293, 4361
 Scanlan, L., 3832
 Scarlata, G., 4854, 4889
 Schaaf, D. W., 3954
 Schäfer, H., 4013
 Schäfer, W., 3858, 3933, 3934, 4053, 4066, 4090, 4094, 4104, 4262, 4293, 4361, 4363, 4515, 4638, 4754, 5082, 5271, 5378, 5427, 5436, 5618, 5630
 Schander, J., 5123
 Schang, P., 4808, 4861, 5020, 5563
 Scharf, H.-D., 5265
 Schäublin, J., 3518
 Schenk, H., 5399
 Scheppele, S. E., 3823
 Scheps, R., 3773, 3876, 4184
 Schiavone, J. A., 5126, 5617
 Schirmer, J., 5269
 Schlag, E. W., 4994, 5132
 Schleker, W., 5265
 Schmelzer, A., 3741, 4180, 4453, 4726, 4993, 5034, 5094, 5313
 Schmidbaur, H., 3782, 5368
 Schmidt, E., 3981
 Schmidt, H., 3859, 3992, 3995, 4091, 4135, 4136, 4290, 4362, 4363, 4423, 4490, 4688, 5122, 5339
 Schmidt, W., 3503, 3644, 3647, 3710, 3846, 3855, 3885, 3948, 3951, 3953, 3990, 4000, 4050, 4077, 4088, 4196, 4488, 4701, 4712, 4824, 4852, 4913
 Schmidtke, H.-H., 4715
 Schmitz, R. F., 4468
 Schmutzler, R., 5462
 Scholz, M., 5258
 Schoof, S., 4887
 Schoonmaker, R. C., 3461, 3464
 Schoos, R., 4961
 Schopman, J., 4318, 5051
 Schrader, B., 4296
 Schubert, R., 3892, 5459, 5493, 5570
 Schulte, H., 4630, 5028
 Schulte, K.-W., 4304
 Schulten, W., 5387
 Schulz, R., 4982, 5131
 Schulz, W., 4756
 Schumacher, E., 4914, 5187
 Schurter, R., 4063
 Schüttler, R., 3933
 Schwartz, M. E., 5625
 Schwarz, H., 3996, 4041, 4044, 4046, 4051, 4062, 4300, 4336, 4346, 5374, 5429, 5484
 Schwarz, M., 4250
 Schwarz, W. H. E., 5182
 Schweig, A., 3850, 3858, 3859, 3861, 3908, 3933, 3934, 3940, 3992, 3993, 3994, 3995, 4053, 4066, 4081, 4083, 4090, 4091, 4094, 4104, 4135, 4136, 4172, 4195, 4262, 4290, 4293, 4304, 4324, 4326, 4361, 4362, 4363, 4423, 4479, 4490, 4508, 4515, 4638, 4688, 4744, 4754, 4779, 4838, 4856, 5082, 5089, 5122, 5131, 5271, 5378, 5427, 5444, 5550, 5618, 5630
 Schweiger, J. R., 3825, 3872, 4261
 Schweikert, O., 4740
 Schweitzer, G. K., 3880, 3963, 4307, 4761, 4806, 4840, 4871, 4981, 5238, 5354
 Schwesinger, R., 4281, 4301
 Scott, J. D., 3776, 3970
 Scott, L. T., 4938
 Scudder, P. H., 4135
 Searcy, A. W., 3466, 3607, 3613, 4016
 Seddon, E. A., 4882, 4986, 5024, 5357, 5565
 Seebach, D., 4291, 5604
 Seel, F., 4332
 Seidl, H., 4097, 4274
 Seitz, G., 4861
 Seitz, W., 3505, 3888
 Seiver, R. L., 3460
 Seki, K., 4284, 4329, 4478, 5104
 Selim, E. T. M., 4534, 5244, 5513
 Sell, J. A., 5017, 5125, 5232, 5408
 Semenov, G. A., 4108, 4245, 5588
 Semkow, A., 5504
 Semmelhack, M. F., 4049, 4189
 Semprini, E., 4427, 4566, 5559
 Sen Sharma, D. K., 3808
 Seppelt, K., 4984
 Serban, I., 4877, 5340, 5414
 Sergeev, Y. L., 5135
 Sergeev, Yu. L., 3752, 4025, 4078
 Sergeyev, Y. L., 5557
 Setser, D. W., 3845
 Seybold, G., 3885
 Seykora, G., 5176
 Shannon, T. W., 3549
 Shanshal, M., 5528
 Shapiro, R. H., 5631, 5633
 Sharp, G. J., 4242, 4256, 4398, 4456, 4559, 4588, 4725
 Sharpe, M. C., 5016
 Shaw, R. W., Jr., 5231
 Shehfeh, M. A., 4604

Sheley, C. F., 3886
 Shen, K.-W., 4036
 Shenton, P. C., 4516
 Sherrod, R. E., 5354
 Shevchenko, V. E., 4663
 Shevchuk, V. U., 3769
 Shikhmamedbekova, A. Z., 5586
 Shimada, K., 3960
 Shimizu, Y., 3624
 Shiokawa, T., 4056
 Shirley, D. A., 4415, 4967, 4970, 5534
 Shudo, K., 4927
 Shu-Shou-Shen, S., 3796
 Shushunov, N. V., 3786
 Sidorov, L. N., 4663
 Sieber, A., 5020
 Siegbahn, K., 3911, 3529, 3645, 3725, 3728, 4351, 4916, 5060, 5197, 5506
 Sienel, G. R., 4585
 Sima, J., 5446
 Simmie, J. M., 3478
 Simmons, L. L., 4873, 4875
 Simmons, N. P. C., 4836, 5033
 Simon, A., 4984
 Simonneaux, G., 5448
 Simpson, I., 5577
 Simpson, J., 3548
 Sims, J., 4719, 5099
 Singh, M., 5290
 Singhal, S. R., 3560
 Siretskii, Yu. G., 4174
 Sirotkin, N. I., 3786
 Sizoy, V. F., 3571
 Skinner, H. A., 5286
 Skinner, H. B., 3466, 4016
 Smagina, E. I., 3456
 Smets, J., 4356, 4924, 4936
 Smith, A. L., 4343
 Smith, D. J., 3534, 3691, 3701, 4186, 4230, 5142, 5208
 Smith, D. R., 3559
 Smith, G., 5511
 Smith, J. A., 4606
 Smith, M., 4616
 Smith, P. G., 3824
 Smith, R. D., 4870
 Smoes, S., 3458, 3557, 4098, 4102, 4486, 4678, 4682, 4874, 4901, 4966
 Smolinsky, G., 3809
 Smyth, K. C., 5126, 5617
 Snell, W., 4510, 4609, 4614, 4616
 Snow, R. A., 5019, 5447
 Snyder, J. P., 3828, 4449, 4691, 5395
 So, Y.-H., 4804
 Sodeck, G., 3652, 3775
 Sojka, S. A., 4019
 Sokolov, S. A., 5552
 Solarz, R. W., 5056, 5186
 Solgadi, D., 4003, 4482, 4567, 4684, 5088
 Solka, B. H., 4603, 5467
 Solouki, B., 3646, 4092, 4150, 4244, 4295, 4680, 4698, 4827, 4984, 5107, 5207, 5216, 5386, 5610
 Sonnessa, A. J., 3730
 Sorokin, L. S., 3729
 Sorokin, V. V., 3523, 4173, 4328, 5512, 5552
 Sorriso, S., 4272, 4566
 Southworth, S., 4771
 Spalding, T. R., 3495, 3548, 5321
 Spanget-Larsen, J., 4461, 4481, 4572, 4637, 4707, 4964, 5192, 5578, 5613
 Spears, D. P., 4225
 Speckamp, W. N., 4217
 Spencer, J. A., 4780
 Spiers, M., 4891, 4892, 4893, 5259
 Spohr, R., 3525, 4655
 Spoliti, M., 3455
 Spunta, G., 4389
 Sridhar, R., 4736
 Srivastava, R. D., 3462, 3463, 3465, 3606, 3617, 3620, 3801, 4054, 4113, 4506, 4881, 4894, 5166
 Stadelmann, J.-P., 4681, 4993, 5241, 5404
 Stafast, H., 3778, 4067, 4294, 4392, 4417, 4476
 Stafford, F. E., 3441, 3652
 Staley, R. H., 4152, 4679
 Stanley, G. G., 5024, 5565
 Stanley, G. S., 5191
 Stanovnik, B., 5396
 Starowieyski, K. B., 5384
 Starzewski, K. A. O., 4181, 4579, 5368, 5442
 Starzewski, K.-H. A. O., 5368
 Stearns, C. A., 3457, 3470, 4005, 4014, 4112, 4207
 Stebbings, W. L., 3753
 Steblevskii, A. V., 5424, 5434
 Stefani, F., 4566, 5559
 Stefanović, D., 4302
 Steichen, J., 3987
 Steiger, R. A., 4528
 Steiger, R. P., 3570
 Stein, U., 4756
 Steinhaus, D. W., 3566
 Stelzer, O., 4474
 Stephan, K., 5176, 5350
 Steudel, R., 4092
 Stewart, W. B., 3492
 Still, I. W. J., 5491
 Stober, R., 4726
 Stockbauer, R., 3919, 4494, 4807, 5009, 5014, 5050, 5106, 5130, 5181, 5615
 Stockdale, J. A. D., 4645
 Storto, G., 5100
 Strachan, P., 3567
 Strack, W., 4024, 5347
 Stracke, H.-U., 5311
 Strafford, R. G., 3474
 Strausz, O.P., 4972
 Street, G. B., 3475
 Streets, D. G., 3873, 4354, 4552, 4662, 4813, 5474
 Strein, K., 5365
 Strozier, R. W., 4781
 Stufkens, D. J., 5139, 5213
 Su, T., 5482
 Sucrow, W., 3580
 Suffolk, R. J., 3696, 3697, 3707, 3708, 3982, 3990, 4212, 4330, 5327
 Sugar, J., 3875, 3974, 4210
 Sugimori, A., 5104
 Sukodub, L. F., 5555
 Sullivan, S. A., 4921
 Sümmerrmann, W., 5379
 Süss, H. U., 5613
 Sustmann, R., 3892, 3937, 5202
 Süzer, S., 5534
 Suzuki, A., 4329
 Suzuki, I. H., 4118, 4197, 4876, 4911, 5128, 5129
 Svec, H. J., 3628, 3791, 4546, 4714, 5291
 Sweigart, D. A., 3718, 3733, 4636, 4724
 Swingler, D. L., 3800, 3802
 Symon, D. A., 4565
 Syrvatka, B. G., 3539, 3769, 4070, 5220, 5554
 Szepes, L., 3444, 4368, 4620, 5013
 Szilagyi, S., 4651

- Szwarc, M., 3960
 Szwarc, R., 3819, 4001
 Tabet, J.-C., 5038
 Tadjeddine, M., 5195
 Tajima, S., 3777, 3624, 4033, 4331, 5121
 Takezawa, S., 3763, 5140
 Takhimova, V. V., 5557-
 Tal'roze, V. L., 4920
 Talvari, A., 5556
 Tam, W.-C., 4224
 Tamás, J., 3939
 Tan, H.-S., 4099
 Tanaka, I., 4020
 Tanaka, K., 4020
 Tanaka, Y., 3763, 5140, 5162, 5247
 Tang, S.-Y., 5290
 Tani, T., 4201
 Taniguchi, S., 3538
 Tanimoto, M., 5318
 Tarli, F., 5285
 Taticchi, A., 3804, 3858, 4626
 Taylor, G. F., 4803
 Taylor, G. N., 4084
 Taylor, J. A., 4910, 4997
 Taylor, J. W., 3753, 4069, 4349, 4932, 4939, 5018
 Taylor, K. G., 4968
 Taylor, L. T., 4213, 4668
 Taylor, M. J., 5327
 Taylor, R. T., 5441
 Templet, P. H., 5245
 Teraji, T., 3759
 Terenin, A., 3586
 Terlouw, J. K., 4228, 4729, 5072, 5086, 5268, 5445
 Terpstra, A., 4992
 Terwilliger, D. T., 4343
 Thames, S. F., 3685
 Thiel, W., 3861, 4779, 5339
 Thistlethwaite, P. J., 3802
 Thomas, J. L., 5217
 Thomas, P. D. P., 4825, 4888
 Thomas, R. K., 3705, 3726, 3734, 4080, 4149, 5105
 Thomas, T. D., 5231
 Thommen, E., 3629
 Thommen, F., 4765
 Thompson, G. L., 4006
 Thompson, H., 3705, 3726, 4080, 5105
 Thompson, H. W., 3863, 4469
 Thompson, K. R., 3985
 Thompson, M., 5190, 5491
 Thon, N., 4479, 4638
 Thorn, R. J., 3448, 4624
 Thorstad, O., 4316, 4317, 4666, 4673, 4677, 4706, 5159
 Thuijl, J. v., 3910
 Thulstrup, E. W., 4637
 Thummel, R. P., 4952
 Thynne, J. C. J., 4543, 5154
 Tiedemann, P. W., 4926, 5015, 5307
 Tilford, S. G., 4182, 4582, 4583, 5449, 5450, 5495, 5496
 Tillett, J. G., 3484
 Timberlake, J. W., 4651
 Timoshenko, M. M., 4266, 4353
 Timpe, H.-J., 5336
 Tišler, M., 5396
 Tokumaru, K., 5486
 Tomer, K. B., 5633
 Tomkins, F. S., 4060, 5511
 Tondello, A., 5338
 Tondello, E., 3822, 4375, 4562, 5189, 5317
 Tondello, G., 4011, 4312
 Toren, E. C., 3758
 Torroni, S., 3807, 4198, 4664, 5326, 5564
 Tóth, T., 4611
 Tousey, R., 4582
 Traeger, J. C., 3811, 3813, 3967, 4545, 4591, 4928, 5025, 5069, 5120, 5293, 5345
 Traylor, T. G., 4211, 4241, 4457
 Tresling, J. D., 4922
 Trevor, D. J., 4923, 4930, 5015
 Trickle, I. A., 4883
 Trickle, I. R., 4657, 4760, 4858, 5371
 Trill, H., 3937
 Trinajstić, N., 5614
 Tripol'skaya, T. A., 5440
 Trofimov, B. A., 5531
 Trombetti, A., 3731
 Trost, B. M., 4135
 Trott, W. M., 5299, 5412
 Trotter, J., 5348
 Trudell, B. C., 5252
 Tsai, B. P., 4308, 4640, 4997
 Tsai, S.-C., 3916
 Tschmutowa, G., 5520
 Tschuikow-Roux, E., 3478
 Tse, A., 5420
 Tse, J., 4822
 Tsuboi, M., 5623
 Tsubomura, H., 4962, 5277, 5278
 Tsuchiya, T., 3624, 3777, 4033, 4331, 5121, 5174
 Tsuji, K., 4201
 Tulupov, V. A., 4592
 Turk, J., 5631, 5633
 Turner, D. W., 3520, 3527, 3677, 3683, 3702, 3703, 3718, 3733, 3854, 3871, 3890, 4322, 4539, 4561
 Tuttle, M., 3851, 4231
 Ulman, J. A., 4519, 4574, 4937, 4949
 Ul'yanova, O. V., 4079
 Undheim, K., 3494, 3627, 3630, 3635, 3636, 3789, 3891, 3977, 4117, 4178, 4316, 4317, 4628, 4666, 4673, 4677, 4706, 4863, 5159, 5416
 Unger, E., 4474
 Utsunomiya, C., 4466, 4564, 4867, 4927, 5249, 5486
 Uy, O. M., 3463, 3606, 3617, 3620, 3819, 4001, 4054
 Uzan, R., 3574, 3745, 3956
 Vaglio, G. A., 4116
 Vajda, J. H., 5460
 Valentin, E., 4452
 Valle, M., 4116
 Vančik, H., 4727
 Van Dam, H., 4908, 4946, 4992, 5096, 5536, 5545
 Van Den Ham, D. M. W., 3722, 3723, 3959, 4523, 5530
 Vander Auwera-Mahieu, A., 3819, 4001
 Van Der Greef, J., 4934, 5083
 Van Der Helm, D., 3915
 Van Der Meer, D., 3722, 3723, 3959, 4523, 5530
 Van der Wiel, M. J., 5170
 Van De Sande, C. C., 5484
 Van Deurzen, C. H. H., 4264
 Van Haverbeke, Y., 5487
 Van Hoorn, M. D., 4538
 Van Niekerk, J. M., 4922
 Van Tilborg, J., 5394, 5551
 Van Veen, E. H., 4530, 4656, 4658, 4671
 Varetto, E. L., 4632
 Varmuza, K., 3556, 4335, 4358
 Varshavsky, Y. M., 5279
 Vasile, M. J., 3809
 Vaziri, C., 4074
 Veith, M., 4581
 Velasco, R., 3768
 Veljković, M., 5242

Venanzi, T. J., 4418
 Venkateswarlu, P., 4027
 Venugopalan, B., 4968
 Verhaegen, G., 4183
 Verhoeven, J. W., 4217, 4815
 Verkade, J. G., 4705, 5042
 Verkin, B. I., 5555
 Verma, R. D., 3560, 5136
 Vermeer, H., 4195, 4262, 4508, 4515, 4638, 4744, 4856, 5122, 5436, 5444, 5630
 Vertal, L. E., 4990
 Viallefont, P., 5228
 Vick, D. O., 4806, 4871
 Vidal, M., 4990
 Vijlhuizen, P. C., 5086
 Vikhlyaev, Yu. I., 4079
 Vilesov, F. I., 3658, 3752, 3765, 3884, 4025, 4043, 4078, 4086, 4279, 4499, 4521, 4675, 5135, 5510, 5514, 5515, 5543, 5589, 5624, 5627
 Villem, Y. Y., 4959, 5021, 5032, 5328
 Vincent, E.-J., 3587, 4437
 Visnapuu, A., 3467
 Vivarelli, P., 4386
 Vlădescu, C., 5340, 5414
 Vocelle, D., 4814
 Vodden, A., 4212
 Vogel, E., 4263, 4531
 Vogel, P., 5315
 Vogt, J., 4681, 4993, 5241, 5404, 5458
 Volkov, A. D., 5588
 Voll, R., 5093
 Vollhardt, K. P. C., 4374, 4779, 4781
 Volz, W. E., 4723
 Vonbacho, P. S., 4778
 von Niessen, W., 4681, 4765, 5369, 5525
 von Rosenberg, J. L., 4828
 Vorlaender, W., 4051
 Vornberger, W., 3782
 Vovna, V. I., 3884, 4043, 4086, 4279, 4499, 4521, 4989, 5510, 5514, 5589, 5624, 5627
 Vtyurina, N. N., 5403
 Vyalykh, E. P., 5531
 Waaijers, H. W., 5213
 Waddington, T. C., 4565
 Wagner, G., 3781, 4276, 4291, 4332, 5632
 Wagner, L. C., 3605, 4128, 4236
 Wahl, A. C., 3928
 Wahlbeck, P. C., 4103, 4147
 Wakabayashi, H., 4513
 Walker, F. A., 5527
 Walker, J. A., 3921, 3931, 4075
 Walker, T. E. H., 3958, 5037
 Walsh, A. D., 5465
 Walsh, R., 5372
 Walters, E. A., 5299, 5412
 Walton, I. B., 5596
 Wanczek, K.-P., 3738
 Wang, H.-t., 5245
 Wang, J. L.-F., 4100
 Wankenne, H., 3812, 5051, 5173
 Ward, C. H., 5362
 Ward, S. D., 3485
 Warneck, P., 3554, 4177
 Watanabe, I., 3874, 3883, 4219, 5161
 Webb, H. M., 4480, 4497, 4527, 4990
 Webb, K. S., 4759, 4834, 4878
 Webb, M. L., 5210
 Webb, T. R., 5005, 5010, 5362, 5367
 Weber, W., 4963
 Weese, G. M., 5268
 Weger, H., 5322
 Weidmann, K., 5463
 Weidner, U., 3850, 3908, 3940, 3994, 4081, 4083, 4172, 4195, 5089, 5550
 Weil, K. G., 3622, 4313, 5153, 5177, 5330
 Weiler, L., 3517, 3842, 3843, 4004, 4140, 4155
 Weinberger, P., 4411
 Weiner, M. A., 4222, 4536, 5438, 5526, 5566
 Weinhold, F., 5581
 Weinstein, M. I., 5590
 Weisman, G. R., 4780, 5280
 Weiss, K., 4254
 Weiss, M. J., 5004, 5388
 Weissler, G. L., 3573
 Wells, P. B., 4625
 Welter, J. M., 4486, 4874
 Wendoloski, J. J., 4669
 Weringa, W. D., 5058, 5316
 Werme, L. O., 3529, 3645, 3725, 3728, 3911
 Werner, A. S., 4308, 4640
 Werp, J., 4338
 Werstiuk, N. H., 4929
 Weschke, W., 5336
 Wesdemiotis, C., 5374
 West, R., 4683
 Weston, C. A., 4661, 5423, 5576
 Westwood, N. P. C., 3511, 3514, 3982, 4138, 4256, 4398, 4404, 4408, 4587, 4696, 4700, 4718, 4737, 4746, 4753, 4763, 4776, 4836, 4857, 5001, 5030, 5033, 5137, 5253, 5295, 5329, 5363, 5562
 Wetzel, J. C., 4326, 4688
 Weyerstahl, P., 5429
 Wherrett, S. R., 3772
 White, G., 3634
 White, M. G., 4500, 4647, 4967
 White, R. M., 4225
 Whiteford, R. A., 3510, 3656, 3661, 4026, 4517
 Whitesides, T. H., 4501
 Whitfield, H. J., 4704
 Wiberg, K. B., 3727, 4669
 Wiberg, N., 4432, 4581, 5248
 Wiczorek, J. S., 4537
 Wielesek, R., 4231, 4510, 4804
 Wildemann, M., 5322
 Wilkins, B. T., 3503, 3855, 3990, 4050, 4077, 4474
 Wilkins, C. L., 3544
 Wilkinson, G., 4733
 Willet, G. D., 4775
 Willett, G. D., 4484, 4489, 4635, 4709, 4716, 4721, 4730, 4732, 4818, 4947, 5201, 5289, 5469, 5544
 Williams, D. H., 3479
 Williams, T. A., 4344, 4364, 4642, 4643, 5055
 Williamson, A. D., 4342, 4369, 4868, 5003, 5274, 5430, 5458, 5616
 Willis, C., 4896
 Wilson, J. W., 3815
 Wilson, P. W., 3570
 Wingard, R. E., Jr., 4006, Jr., 4008
 Winkler, J., 4223
 Winter, M., 4634, 5008
 Winters, H. F., 3475
 Winterstein, W., 4299, 4526
 Wirz, J., 4180, 4374, 4652, 4935, 5053
 Wiseman, J. R., 4569
 Wittel, K., 3648, 3746, 4291, 4303, 4310, 4345, 4380, 4496, 4512, 4549, 4581, 4599, 4653, 5198
 Wöhrlé, D., 5488
 Wolff, G., 4458
 Wolkoff, P., 5284, 5483
 Wong, P. C., 5260
 Wood, K. V., 5018

Woodley, D. G., 4806
 Worden, E. F., 5056, 5165, 5186
 Work, D. E., 3976
 Worley, R. E., 3561
 Worley, S. D., 3886, 3907, 4258, 4278, 4742, 4772, 4810, 4968,
 5005, 5010, 5362, 5367, 5477
 Worman, J. J., 5499
 Worrell, C., 4217, 4815
 Worrell, C. W., 4260
 Wöste, L., 4914, 5187
 Wright, J. G., 4988, 5398
 Wright, J. M., 4241
 Wu, C. H., 4568, 4912, 5164, 5188, 5254, 5334, 5393
 Wu, H. Y., 4103
 Wu, M., 4498, 4550, 5324
 Wulfson, N. S., 3571, 5452, 5598
 Wyatt, J. R., 4870
 Yamabe, T., 4769
 Yamaguchi, R., 4955
 Yamakawa, M., 4551
 Yamamoto, H., 4136
 Yamazaki, T., 3984, 4513, 4631, 5214
 Yanson, I. K., 5555
 Yarbrough II, L. W., 5602
 Yee, D., 4224
 Yokota, K., 3964, 4475, and Nagakura, S., 4464
 Yokoyama, Y., 3874, 3883, 4056, 4219, 5161
 Yonezawa, T., 3712, 5476
 Yoshihara, K., 4056
 Yoshikawa, K., 3712, 4133, 4830
 Yoshino, K., 5162
 Younathan, E. S., 5093
 Young, D., 4393
 Young, D. W., 5481
 Young, S. D., 5562
 Young, V. Y., 4524, 4649
 Yu, C., 5492, 5594
 Yuan, D., 5267
 Zafarani-Moattar, M. T., 5286
 Zahran, N. F., 5059
 Zaikin, V. G., 5451, 5452, 5598
 Zaletov, V. G., 4035
 Zanella, P., 4562, 4585
 Zaretskii, V. I., 3571
 Zaretskii, Z. V. I. 5413
 Zauli, C., 3731, 5456
 Zelenov, V. V., 4920
 Zimina, K. I., 3767
 Zmbov, K. F., 4119, 4912, 5163, 5188, 5242, 5393
 Zollweg, R. J., 4122
 Zverev, V. V., 3884, 4043, 4499, 5021, 5032, 5328, 5589, 5627
 Zverev, Y. B., 5490

Bibliography

- [3440] Cocke, D. L., and Gingerich, K. A. Mass spectrometric determination of the dissociation energies of the molecules Ho_2 , HoAg , and HoAu , *J. Phys. Chem.* **75**, 3264 (1971).
- [3441] Baylis, A. B., Pressley, G. A., Jr., and Stafford, F. E. Mass spectrometric investigation of the pyrolysis of boranes. IV. Diborane, *J. Am. Chem. Soc.* **88**, 2428 (1966).
- [3442] DeCorpo, J. J., Bafus, D. A., and Franklin, J. L. Enthalpies of formation of the monohalomethyl radicals from mass spectrometric studies of the dihalomethanes, *J. Chem. Thermodyn.* **3**, 125 (1971).
- [3443] Bentley, T. W., Johnstone, R. A. W., and Mellon, F. A. Aspects of mass spectra of organic compounds. Part IX. Evidence against charge localization in the fragmentation of methionine and selenomethionine, *J. Chem. Soc. (B)*, 1800 (1971).
- [3444] Borossay, J., Csákvári, B., and Szepes, L. Determination of bond energies of organic silicon compounds on the basis of appearance potentials, *Intern. J. Mass Spectrom. Ion Phys.* **7**, 47 (1971).
- [3445] Daly, N. R. Higher autoionization processes in argon and xenon, *Proc. Phys. Soc.* **85**, 897 (1965).
- [3446] Brown, P. Kinetic studies in mass spectrometry. VIII. Competing $[\text{M}-\text{CH}_2]$ and $[\text{M}-\text{CH}_2\text{O}]$ reactions in substituted anisoles. Approximate activation energies from ionization and appearance potentials, *Org. Mass Spectrom.* **4**, 519 (1970).
- [3447] Brown, P. Kinetic studies in mass spectrometry. IX. Competing $[\text{M}-\text{NO}_2]$ and $[\text{M}-\text{NO}]$ reactions in substituted nitrobenzenes. Approximate activation energies from ionization and appearance potentials, *Org. Mass Spectrom.* **4**, 533 (1970).
- [3448] Cater, E. D., Rauh, E. G., and Thorn, R. J. Thermochemistry of UOS; evaporation of $\text{US}-\text{UO}_2$ mixtures; on the attainment of equilibrium in Knudsen cells, *J. Chem. Phys.* **49**, 5244 (1968).
- [3449] Edwards, J. G., Franzen, H. F., and Gilles, P. W. High-temperature mass spectrometry, vaporization, and thermodynamics of titanium monosulfide, *J. Chem. Phys.* **54**, 545 (1971).
- [3450] Gupta, S. K. A thermodynamic investigation of the tungsten-oxygen-hromine system, *J. Phys. Chem.* **75**, 112 (1971).
- [3451] Gupta, S. K. Thermal stabilities of tungsten oxyiodides, *J. Phys. Chem.* **73**, 4086 (1969).
- [3452] Daly, N. R., and Powell, R. E. Electron collisions in nitrogen, *Proc. Phys. Soc.* **89**, 273 (1966).
- [3453] Cantone, B., Emma, V., and Grasso, F. Fine structure near the ionization threshold of Kr , O_2 , NO by electron impact, *Advan. Mass Spectrom.* **4**, 599 (1968).
- [3454] Dougherty, R. C., Bertorello, H. E., and Martínez de Bertorello, M. Mass spectra and thermochemistry of methyl phenanthrenes. A contribution to the analogy between mass spectral and thermal fragmentation reactions, *Org. Mass Spectrom.* **5**, 1321 (1971).
- [3455] Guido, M., Balducci, G., Gigli, G., and Spoliti, M. Mass spectrometric study of the vaporization of cuprous chloride and the dissociation energy of Cu_2Cl_2 , Cu_3Cl_3 , and Cu_4Cl_4 , *J. Chem. Phys.* **55**, 4566 (1971).
- [3456] Smagina, E. I., and Kutsev, V. S. A mass-spectrometric study of the mechanism of the decomposition of lanthanum oxide fluoride, *Zh. Fiz. Khim.* **45**, 46 (1971) [Engl. transl.: *Rus. J. Phys. Chem.* **45**, 24 (1971)].
- [3457] Stearns, C. A., and Kohl, F. J. Vaporization thermodynamics of the lanthanum carbon system. Mass spectrometric determination of the dissociation energy of LaC_2 , LaC_3 , and LaC_4 , *J. Chem. Phys.* **54**, 5180 (1971).
- [3458] Smoes, S., Mvers, C. E., and Drowart, J. Determination of the atomization energies of CP , C_3P , CP_2 and C_3P_2 by high temperature Knudsen cell mass spectrometry, *Chem. Phys. Letters* **8**, 10 (1971).
- [3459] Hariharan, A. V., and Eick, H. A. Vaporization thermodynamics of europium(II) sulfide, *High Temp. Sci.* **3**, 123 (1971).
- [3460] Seiver, R. L., and Eick, H. A. Vapor pressure measurements in the samarium dicarbide-carbon and thulium dicarbide-carbon systems, *High Temp. Sci.* **3**, 292 (1971).
- [3461] Schoonmaker, R. C., and Porter, R. F. Mass spectrometric study of alkali hydroxide vapors, *J. Chem. Phys.* **31**, 830 (1959).
- [3462] Srivastava, R. D., and Farber, M. Mass spectrometric determination of the heats of formation of AlOCl(g) and AlOF(g) , *J. Phys. Chem.* **75**, 1760 (1971).
- [3463] Farber, M., Srivastava, R. D., and Uy, O. M. Mass spectrometric determination of the heat of formation of the AlO_2 molecule, *J. Chem. Phys.* **55**, 4142 (1971).
- [3464] Porter, R. F., and Schoonmaker, R. C. Mass spectrometric study of the vaporization of LiF , NaF , and $\text{LiF}-\text{NaF}$ mixtures, *J. Chem. Phys.* **29**, 1070 (1958).
- [3465] Srivastava, R. D., and Farber, M. Thermodynamic properties of the $\text{B}-\text{Cl}-\text{F}$ system from mass spectrometer investigations, *Trans. Faraday Soc.* **67**, 2298 (1971).
- [3466] Skinner, H. B., and Searcy, A. W. Demonstration of the existence of La_2F_6 gas and determination of its stability, *J. Phys. Chem.* **75**, 108 (1971).
- [3467] Visnapuu, A., and Marek, B. C. Properties of silver bromide vapors, *J. Less-Common Metals* **25**, 89 (1971).
- [3468] Gingerich, K. A. Gaseous metal borides. III. The dissociation energy and heat of formation of gold monoboride, *J. Chem. Phys.* **54**, 2646 (1971).
- [3469] Gingerich, K. A. Gaseous metal nitrides. IV. The dissociation energy of cerium mononitride, *J. Chem. Phys.* **54**, 3720 (1971).
- [3470] Kohl, F. J., and Stearns, C. A. Mass spectrometric determination of the dissociation energy of ScC_2 and ScC_3 , *J. Chem. Phys.* **54**, 1414 (1971).
- [3471] Gingerich, K. A., and Finkbeiner, H. C. Dissociation energy of diatomic cerium and predicted stability of gaseous intermetallic cerium compounds, *J. Chem. Phys.* **54**, 2621 (1971).
- [3472] Gingerich, K. A., and Piacente, V. Gaseous phosphorus compounds. IV. Thermodynamic study of gallium monophosphide with a mass spectrometer and dissociation energy of aluminum diphosphide, *J. Chem. Phys.* **54**, 2498 (1971).
- [3473] Gingerich, K. A., and Pupp, C. Mass spectrometric determination of the heats of formation and atomization of gaseous AuBO , *J. Chem. Phys.* **54**, 3713 (1971).
- [3474] Glockling, F., and Strafford, R. G. Electron impact studies on some group III metal alkyls, *J. Chem. Soc. (A)*, 1761 (1971).
- [3475] Munir, Z. A., Street, G. B., and Winters, H. F. Mass-spectrometric and vapor pressure studies on the sublimation of realgar (As_4S_4), *J. Chem. Phys.* **55**, 4520 (1971).
- [3476] Hedaya, E., Kent, M. E., McNeil, D. W., Lossing, F. P., and McAllister, T. The thermal rearrangement of phenylnitrene to cyanocyclopentadiene, *Tetrahedron Letters* **30**, 3415 (1968).
- [3477] Harris, M. M., Loudon, A. G., and Mazengo, R. Z. Ring expansion reactions in aromatic systems. A study of steric strain in some *n,n'*-dimethyl-1,1'-binaphthyls, *Org. Mass Spectrom.* **5**, 1123 (1971).
- [3478] Simmie, J. M., and Tschuikow-Roux, E. Mass spectrum, appearance potentials and bond dissociation energies of

- 1,1,1-trifluoroethane, Intern. J. Mass Spectrom. Ion Phys. **7**, 41 (1971).
- [3479] Williams, D. H., Cooks, R. G., and Howe, J. Studies in mass spectrometry. XXXI. A comparison of reaction rates in common ions generated via fragmentation and direct ionization, J. Am. Chem. Soc. **90**, 6759 (1968).
- [3480] Benezra, S. A., and Bursey, M. M. *ortho*-Effects in mass spectra. Alteration of the molecular-ion energy distribution in disubstituted acetanilides, Z. Naturforsch. **27a**, 670 (1972).
- [3481] Pihlaja, K., and Jalonen, J. Appearance potentials determined by the electron-impact method as an analytical aid in the evaluation of conformational energies and clarification of ring conformation-I: Appearance potentials of the $[M-R]^+$ ions formed in the primary fragmentation of stereo-isomeric 1,3-dioxans. A direct route to conformational energies, Org. Mass Spectrom. **5**, 1363 (1971).
- [3482] Linda, P., Marino, G., and Pignataro, S. A comparison of sensitivities to substituent effects of five-membered heteroaromatic rings in gas phase ionization, J. Chem. Soc. (B), 1585 (1971).
- [3483] Benezra, S. A., and Bursey, M. M. *ortho*-Effects on ordering factors in mass spectral rearrangements. Loss of keten from halogenated phenyl acetates and acetanilides, J. Chem. Soc. (B), 1515 (1971).
- [3484] Gamble, A. A., Gilbert, J. R., and Tillett, J. G. Substituent effects on the mass spectra of substituted phenyl acetates, Org. Mass Spectrom. **5**, 1093 (1971).
- [3485] Johnstone, R. A. W., Mellon, F. A., and Ward, S. D. On-line computer methods used in conjunction with the measurement of ionization and appearance potentials, Advan. Mass Spectrom. **5**, 334 (1971).
- [3486] Okudaira, S. Multiple ionization of Ca, Sr and Ba by electron impact, J. Phys. Soc. Japan **29**, 409 (1970).
- [3487] Haney, M. A., and Franklin, J. L. Heats of formation of H_3O^+ , H_3S^+ , and NH_4^+ by electron impact, J. Chem. Phys. **50**, 2028 (1969).
- [3488] Hickling, R. D., and Jennings, K. R. Kinetic shifts and metastable transitions, Org. Mass Spectrom. **3**, 1499 (1970).
- [3489] Redhead, P. A. Multiple ionization in carbon monoxide by successive electron impacts, Can. J. Phys. **47**, 2449 (1969).
- [3490] Franklin, J. L., and Haney, M. A. Energy distribution in ionic decomposition processes, Recent Developments in Mass Spectroscopy, ed. K. Ogata and T. Hayakawa (Baltimore University Park Press, Baltimore, 1970) p. 909.
- [3491] Makowiecki, D. M., Lynch, D. A., and Carlson, K. D. Infrared spectra of the aluminum family suboxides, J. Phys. Chem. **75**, 1963 (1971).
- [3492] Brion, C. E., Farmer, J. S. H., Pincock, R. E., and Stewart, W. B. Mass spectra of some geometric isomers at 1216 Å and 584 Å: The photoionization of isomeric tricyclo [3.2.1.0^{2,1}] octanes and related compounds, Org. Mass Spectrom. **4**, 587 (1970).
- [3493] Meisels, G. G., and Giessner, B. G. Threshold behavior and the determination of appearance potentials from second differential ionization efficiencies, Intern. J. Mass Spectrom. Ion Phys. **7**, 489 (1971).
- [3494] Hvistendahl, G., and Undheim, K. Ionization potentials of stable free radicals, Chemica Scripta **1**, 123 (1971).
- [3495] Cardin, D. J., Keppie, S. A., Lappert, M. F., Litzow, M. R., and Spalding, T. R. Binuclear organometallic compounds. Part III. Metal-metal bond dissociation energies, Raman, and infrared spectra for the series $(\pi-C_5H_5)(CO)_2M^1M^2Me_2$; ($M^1=Cr, Mo, or W$; $M^2=Ge or Sn$), J. Chem. Soc. (A), 2262 (1971).
- [3496] Bursey, M. M., and Rogerson, P. F. The electron impact ionization potentials of successively substituted acetylacetonates of rhodium(III), Inorg. Chem. **10**, 1313 (1971).
- [3497] Bonati, F., Distefano, G., Innorta, G., Minghetti, G., and Pignataro, S. Ionization energies of rhodium and iridium β -diketonates: on the nature of the last occupied orbital, Z. Anorg. Allg. Chem. **386**, 107 (1971).
- [3498] Distefano, G., Foffani, A., Innorta, G., and Pignataro, S. Mass spectrometric study of transition metal complexes with ligands having nitrogen or sulphur as donor atom, Advan. Mass Spectrom. **5**, 696 (1971).
- [3499] Cornford, A. B., Frost, D. C., Herring, F. G., and McDowell, C. A. The photoelectron spectrum of the free radical chlorine dioxide, Chem. Phys. Letters **10**, 345 (1971).
- [3500] Berkowitz, J. Experimental potential energy curves for $X^2\Pi$ and $^2\Sigma^+$ states of HF^+ , Chem. Phys. Letters **11**, 21 (1971).
- [3501] Brundle, C. R., and Jones, G. R. The molecular orbital energy levels and bonding in krypton difluoride, Chem. Commun., 1198 (1971).
- [3502] Cradock, S., and Ebsworth, E. A. V. Photo-electron spectra of silyl and germyl halides and $(p \rightarrow d)\pi$ bonding, Chem. Commun., 57 (1971).
- [3503] Green, M. C., Lappert, M. F., Pedley, J. B., Schmidt, W., and Wilkins, B. T. Photoelectron spectra and energy level trends in Me_nSiCl_{4-n} and related series, J. Organometal. Chem. **31**, C55 (1971).
- [3504] Bock, H., and Ensslin, W. Bond-bond interaction in polysilanes, Angew. Chem. Intern. Ed. **10**, 404 (1971).
- [3505] Haselbach, E., Heilbronner, E., Mannschreck, A., and Seitz, W. Lone pair interaction in 3,3-dimethyldiazirine, Angew. Chem. Intern. Ed. **9**, 902 (1970).
- [3506] Lloyd, D. R., and Lynaugh, N. Photoelectron spectra of the symmetric trimethylborazines, Chem. Commun. **3**, 125 (1971).
- [3507] Anderson, C. P., Mamantov, G., Bull, W. E., Grimm, F. A., Carver, J. C., and Carlson, T. A. Photoelectron spectrum of chlorine monofluoride, Chem. Phys. Letters **12**, 137 (1971).
- [3508] Cradock, S. The photoelectron spectra of GeH_4 and GeF_4 , Chem. Phys. Letters **10**, 291 (1971).
- [3509] Bischof, P., Heilbronner, E., Prinzbach, H., and Martin, H. D. A photoelectron-spectroscopic investigation of the homoconjugative interaction between π - and *Walsh*-orbitals in *endo*- and *exo*-cyclopropano-norbornene, Helv. Chim. Acta **54**, 1072 (1971).
- [3510] Cradock, S., and Whiteford, R. A. Photo-electron spectra of the mono and dihalo silanes and germanes, Trans. Faraday Soc. **67**, 3425 (1971).
- [3511] Frost, D. C., Herring, F. G., Katrib, A., McLean, R. A. N., Drake, J. E., and Westwood, N. P. C. Photoelectron spectra and bonding in some halosilanes, Can. J. Chem. **49**, 4033 (1971).
- [3512] Cetinkaya, B., King, G. H., Krishnamurthy, S. S., Lappert, M. F., and Pedley, J. B. Photoelectron spectra of electron-rich olefins and an isostructural boron compound; olefins of exceptionally low first ionisation potential, Chem. Commun., 1370 (1971).
- [3513] Gleiter, R., Heilbronner, E., and Hornung, V. Lone pair interaction in pyridazine, pyrimidine, and pyrazine, Angew. Chem. Intern. Ed. **9**, 901 (1970).
- [3514] Frost, D. C., Herring, F. G., Katrib, A., McLean, R. A. N., Drake, J. E., and Westwood, N. P. C. $(p \rightarrow d)\pi$ Bonding in halosilanes; evidence from photoelectron spectroscopy, Chem. Phys. Letters **10**, 347 (1971).
- [3515] Frost, D. C., Katrib, A., McDowell, C. A., and McLean, R. A. N. The 2A_1 band in the photoelectron spectrum of hydrogen sulphide, Intern. J. Mass Spectrom. Ion Phys. **7**, 485 (1971).
- [3516] Edqvist, O., Åsbrink, L., and Lindholm, E. On the photoelectron spectrum of NO, Z. Naturforsch. **26a**, 1407 (1971).
- [3517] Chadwick, D., Frost, D. C., and Weiler, L. The photoelectron

- spectra of cyclic ketones, *Tetrahedron Letters* **47**, 4543 (1971).
- [3518] Cowan, D. O., Gleiter, R., Glemser, O., Heilbronner, E., and Schäublin, J. The photoelectron spectrum of thiazyl fluoride (NSF), *Helv. Chim. Acta* **54**, 1559 (1971).
- [3520] Baker, A. D., Brundle, C. R., and Turner, D. W. The interpretation of photoelectron spectra especially those of benzene and water, *Intern. J. Mass Spectrom. Ion Phys.* **1**, 443 (1968).
- [3521] Appell, J., and Kubach, C. On the formation of energetic protons by electron impact on methane, *Chem. Phys. Letters* **11**, 486 (1971).
- [3523] Potapov, V. K., and Sorokin, V. V. Photoionization and ion-molecule reactions in quinones and alcohols, *Khim. Vys. Energ.* **5**, 487 (1971) [Engl. transl.: *High Energy Chem.* **5**, 435 (1971)].
- [3524] Nicholson, A. J. C. Determination of bond dissociation energies from photoionization efficiency curves, *Recent Developments in Mass Spectrometry*, ed. K. Ogata and T. Hayakawa (University Park Press, Baltimore, 1970) p. 745.
- [3525] Spohr, R., Guyon, P. M., Chupka, W. A., and Berkowitz, J. Threshold photoelectron detector for use in the vacuum ultraviolet, *Rev. Sci. Instr.* **42**, 1872 (1971).
- [3526] Loginov, M. V., and Mittsev, M. A. Thermal dissociation of SrCl_2 molecules at a tungsten surface, *Zh. Tekh. Fiz.* **41**, 709 (1971) [Engl. transl.: *Sov. Phys.-Tech. Phys.* **16**, 557 (1971)].
- [3527] Evans, S., Orchard, A. F., and Turner, D. W. A simple, medium resolution helium(I) photoelectron spectrometer, *Intern. J. Mass Spectrom. Ion Phys.* **7**, 261 (1971).
- [3528] Carlson, T. A., and Anderson, C. P. Angular distribution of the photoelectron spectrum for benzene, *Chem. Phys. Letters* **10**, 561 (1971).
- [3529] Rabalais, J. W., Bergmark, T., Werme, L. O., Karlsson, L., and Siegbahn, K. The Jahn-Teller effect in the electron spectrum of methane, *Phys. Scr.* **3**, 13 (1971).
- [3530] Åsbrink, L., and Rabalais, J. W. Comments on the high resolution photoelectron spectrum of H_2O and D_2O , *Chem. Phys. Letters* **12**, 182 (1971).
- [3531] Åsbrink, L. The photoelectron spectrum of H_2 , *Chem. Phys. Letters* **7**, 549 (1970).
- [3532] Brogli, F., and Heilbronner, E. The competition between spin orbit coupling and conjugation in alkyl halides and its repercussion on their photoelectron spectra, *Helv. Chim. Acta* **54**, 1423 (1971).
- [3533] Frost, D. C., and Sandhu, J. S. Ionization potentials of ethylene and some methyl-substituted ethylenes as determined by photoelectron spectroscopy, *Indian J. Chem.* **9**, 1105 (1971).
- [3534] Jonathan, N., Morris, A., Ross, K. J., and Smith, D. J. High resolution vacuum ultraviolet photoelectron spectra of transient species: $\text{O}_2^+(\Delta_g)$ and previously unobserved states of O_2^+ , *J. Chem. Phys.* **54**, 4954 (1971).
- [3535] Holmes, J. L., and McGillivray, D. The mass spectra of isomeric hydrocarbons—I: Norbornene and nortricyclene; The mechanisms and energetics of their fragmentations, *Org. Mass Spectrom.* **5**, 1349 (1971).
- [3536] Berkowitz, J. Photoionization mass spectrometry and photoelectron spectroscopy of high temperature vapors, *Advan. High Temp. Chem.* **3**, 123 (1971).
- [3537] Čermák, V. Penning ionization electron spectroscopy. III. Ionization of cadmium, *Coll. Czech. Chem. Com.* **36**, 948 (1971).
- [3538] Matsumoto, A., Taniguchi, S., and Hayakawa, T. Studies of dissociation of hydrogen and n-butane metastable ions by a pulsed ion source, *Recent Developments in Mass Spectrometry*, ed. K. Ogata and T. Hayakawa (University Park Press, Baltimore, 1970) p. 820.
- [3539] Syrvatka, B. G., Bel'ferman, A. L., Gil'burb, M. M., and Moin, F. B. Determination of the dissociation energy of the double bond in some fluorochlorosubstituted ethylenes and their ions by electron bombardment, *Zh. Org. Khim.* **7**, 9 (1971) [Engl. transl.: *J. Org. Chem. USSR* **7**, 8 (1971)].
- [3540] Murphy, Jr., C. B., and Enrione, R. E. Mass spectrometric determination of bond dissociation energies in $\text{BF}_3\cdot\text{OEt}_2$, *Chem. Comm.*, 1622 (1971).
- [3541] Hotop, H., and Niehaus, A. Reactions of excited atoms and molecules with atoms and molecules. II. Energy analysis of Penning electrons, *Z. Physik* **228**, 68 (1969).
- [3543] Foster, R. Ionization potentials of electron donors, *Nature* **183**, 1253 (1959).
- [3544] Gross, M. L., and Wilkins, C. L. Computer-assisted ion cyclotron resonance appearance potential measurements for C_5H_{10} isomers, *Anal. Chem.* **43**, 1624 (1971).
- [3545] Herberich, G. E., Greiss, G., Heil, H. F., and Müller, J. Paramagnetic borabenzene cobalt complexes, *Chem. Comm.*, 1328 (1971).
- [3546] Pitt, C. G. Hyperconjugation: an alternative to the concept of the $p_\pi-d_\pi$ bond in Group IV chemistry, *J. Organometal. Chem.* **23**, C35 (1970).
- [3547] Murphy, C. B., and Enrione, R. E. Bond dissociation energies of the 1- and 2- isomers of pentaborane derivatives by electron impact and by extended Hückel calculations, *Intern. J. Mass Spectrom. Ion Phys.* **7**, 327 (1971).
- [3548] Lappert, M. F., Pedley, J. B., Simpson, J., and Spalding, T. R. Bonding studies of compounds of boron and the Group IV elements. VI. Mass spectrometric studies on compounds Me_3M and $\text{Me}_3\text{M}-\text{M}'\text{Me}_3$ (M and M' = C, Si, Ge, Sn, and Pb): thermochemical data, *J. Organometal. Chem.* **29**, 195 (1971).
- [3549] Gaidis, J. M., Briggs, P. R., and Shannon, T. W. Mass spectra of disilanes. Phenyl-silicon interaction and silicon-silicon bond strength, *J. Phys. Chem.* **75**, 974 (1971).
- [3550] Majer, J. R., Olavesen, C., and Robb, J. C. Wavelength effect in the photolysis of halogenated ketones, *J. Chem. Soc. (B)*, 48 (1971).
- [3551] Lawless, E. W. Mass spectrometric evidence of dimers in bismuth pentafluoride and antimony pentafluoride, *Inorg. Chem.* **10**, 2084 (1971).
- [3552] Grützmacher, H. F., and Hübner, J. Bildung und Struktur von $\text{C}_6\text{H}_4\text{O}$ bei der Pyrolyse von Salicylsäureestern und verwandten Verbindungen, *Liebigs Ann. Chem.* **748**, 154 (1971).
- [3553] Grützmacher, H. F., and Hübner, J. Massenspektrometrie instabiler Moleküle. VII. Thermische Bildung von Fulven-6-on durch zweifache Ringverengung von 3-Bromtropolon, *Tetrahedron Letters* **19**, 1455 (1971).
- [3554] Warneck, P. Photoionisation von Methanol und Formaldehyd, *Z. Naturforsch.* **26a**, 2047 (1971).
- [3555] Gutbier, H. Massenspektrometrische Untersuchungen der Verdampfungsvorgänge bei einigen Verbindungen mit Zinkblende-Gitter im Temperaturbereich um 1000°K, *Z. Naturforsch.* **16a**, 268 (1961).
- [3556] Varmuza, K., and Krenmayr, P. Massenspektrometrische Untersuchungen einfacher und gemischter Phosphortrihalogenide, *Monatsh. Chem.* **102**, 1037 (1971).
- [3557] Pattoret, A., Drowart, J., and Smoes, S. Etudes thermodynamiques par spectrometrie de masse sur le systeme uranium-oxygene, *Thermodyn. Nucl. Mater., Proc. Symp.*, Vienna, 1967, 613 (1968).
- [3558] Kuznetsova, L. A., Kuzmenko, N. E., and Kuzyakov, Yu. Ya. Emission spectrum of the SiBr^+ molecule, *Opt. Spektrosk.* **24**, 812 (1968) [Engl. transl.: *Opt. Spectry.* **24**, 434 (1968)].
- [3559] Smith, D. R., and Raymonda, J. W. Rydberg states in fluorinated benzenes: hexa-, penta-, and mono-fluorobenzene, *Chem. Phys. Letters* **12**, 269 (1971).

- [3560] Verma, R. D., Dixit, M. N., Jois, S. S., Nagaraj, S., and Singhal, S. R. Emission spectrum of the PO molecule. Part II. $^2\Sigma^- \rightarrow ^2\Sigma$ transitions, *Can. J. Phys.* **49**, 3180 (1971).
- [3561] Worley, R. E., and Jenkins, F. A. A new Rydberg series in N₂, *Phys. Rev.* **54**, 305 (1938).
- [3564] Rao, T. V. R., and Lakshman, S. V. J. The true potential energy curves and Franck-Condon factors of SiH and SiH⁺ molecules, *Physica*, **56**, 322 (1971).
- [3565] McDiarmid, R. Higher electronic states of ReF₆, *J. Mol. Spectry*, **39**, 332 (1971).
- [3566] Radziemski, L. J., Jr., Steinhaus, D. W., and Cowan, R. D. Present status of the analysis of U_I and U_{II} as derived from measurements of optical spectra, *J. Opt. Soc. Am.* **60**, 1556 (1970).
- [3567] Donovan, R. J., and Strachan, P. Vacuum U.-V. spectra of transient molecules and radicals, *Trans. Faraday Soc.* **67**, 3407 (1971).
- [3569] Gleiter, R., Hornung, V., Lindberg, B., Högberg, S., and Lozac'h, N. The He-584 Å and X-ray photoelectron spectra of thiathiophthenes, *Chem. Phys. Letters* **11**, 401 (1971).
- [3570] Adams, G. P., Margrave, J. L., Steiger, R. P., and Wilson, P. W. The enthalpy of sublimation of germanium difluoride and the thermodynamics of sublimation of the Group IVA difluorides, *J. Chem. Thermodyn.* **3**, 297 (1971).
- [3571] Zaretskii, V. I., Sadovskaya, V. L., Wulfson, N. S., Sizoy, V. F., and Merimson, V. G. Mass spectrometry of steroid systems-XXI. Appearance and ionization potentials for the stereoisomers of the D-homoestrane series, *Org. Mass Spectrom.* **5**, 1179 (1971).
- [3573] Weissler, G. L., Ogawa, M., and Judge, D. L. Absorption of O₂, CO₂ and CS₂; fluorescence from CS₂; and photoionization of atomic carbon, *J. Physique Supp.* **32**, C4-154 (1971).
- [3574] Cabaud, B., Uzan, R., and Nounou, P. Étude des processus d'ionisation à haute température des vapeurs métalliques par couplage d'une cellule de Knudsen et d'une source Fox. I. Interprétation des processus d'ionisation de Ag et influence de la température sur les courbes d'efficacité d'ionisation, *Intern. J. Mass Spectrom. Ion Phys.* **6**, 89 (1971).
- [3575] Lageot, C. Potentiel d'ionisation, courbes d'efficacité d'ionisation différentielle, localisation de la charge de 9 cyclopropanes, *Org. Mass Spectrom.* **5**, 845 (1971).
- [3576] Gleiter, R., Heilbronner, E., and de Meijere, A. Die konjugative Wechselwirkung zwischen π - und Walsh-Orbitalen: das Photoelektron-Spektrum des Homofulvens, *Helv. Chim. Acta* **54**, 1029 (1971).
- [3577] Briegleb, G., Czekalla, J., and Reuss, G. Mesomeriemomente und Elektronenüberführungsbanden von Elektronen-Donator-Akzeptor-Komplexen des Chloranils und Tetracyanäthylens mit aromatischen Kohlenwasserstoffen, *Z. Physik. Chem.* **30**, 333 (1961).
- [3578] Müller, J., and Fenderl, K. Reaktionen des π -Cyclopentadienyl-mangantricarboxyl-Kations mit einfachen Fluorverbindungen in der Gasphase, *Chem. Ber.* **104**, 2207 (1971).
- [3579] Müller, J., and Fenderl, K. Sekundär-Ionen in den Massenspektren von Organochrom-Komplexen, *Chem. Ber.* **104**, 2199 (1971).
- [3580] Sucrow, W., Bethke, H., and Chondromatidis, G. Thermolyse von 1,2,4,5-Tetramethyl-hexahydro-1,2,4,5-tetrazinen im Massenspektrometer, *Tetrahedron Letters* **19**, 1481 (1971).
- [3581] Lageot, C. Potentiel d'ionisation, potentiel d'apparition et courbes d'ionisation différentielle pour les 1-2 dimethylcyclohexanes *cis* et *trans*, *Org. Mass Spectrom.* **5**, 839 (1971).
- [3582] Fischer, E. O., Kreiter, C. G., Kollmeier, H. J., Müller, J., and Fischer, R. D. Übergangsmetall-Carben-Komplexe. XXVII. Ringsubstituierte (Methoxyphenylcarben)-pentacarbonylchrom(0)-Komplexe, *J. Organometal. Chem.* **28**, 237 (1971).
- [3583] Grützmacher, H. -F., and Hübner, J. Massenspektrometrie instabiler Moleküle. III: Nachweis und Untersuchungen zur Stabilität chlosubstituierter Dehydrobenzole in der Gasphase, *Org. Mass Spectrom.* **2**, 649 (1969).
- [3584] Bock, H., and Füss, W. Ionisierungsenergien und Geometrie von Aminoboranen, *Chem. Ber.* **104**, 1687 (1971).
- [3585] Praet, M. -Th. Ionisation et dissociation du 1-méthylcyclopentène, du méthylencyclopentane et de quelques isomères par impact d'électrons et de photons, *Org. Mass Spectrom.* **4**, 65 (1970).
- [3586] Terenin, A. Charge transfer in organic solids, induced by light, *Proc. Chem. Soc.*, 321 (1961).
- [3587] Salmona, G., Ferré, Y., and Vincent, E. J. Études expérimentales et théoriques de potentiels d'ionisation de dérivés de la série de l'isothiazole, *C. R. Acad. Sci., Ser. C*, **273**, 863 (1971).
- [3588] Bonnier, J. -M., Gelus, M., and Nounou, P. Contribution à l'étude de l'effet inductif et de l'effet d'hyperconjugaison dans quelques méthylaromatiques, *J. Chim. Phys.* **10**, 1191 (1965).
- [3589] Cullen, W. R., Frost, D. C., and Leeder, W. R. The ultraviolet and photoelectron spectra of some unsaturated fluorocarbon derivatives, *J. Fluorine Chem.* **1**, 227 (1971/72).
- [3590] Audier, H. E., Bouchoux, G., and Fetizon, M. Ionisation et fragmentation en spectrométrie de masse. II. Influence du substituant sur des fragmentations compétitives en série aromatique, *Bull. Soc. Chim. Fr.* **3**, 858 (1971).
- [3594] Balducci, G., De Maria, G., Guido, M.; and Piacente, V. Dissociation energy of TiO and TiO₂ gaseous molecules, *J. Chem. Phys.* **56**, 3422 (1972).
- [3595] Blackburn, P. E., and Danielson, P. M. Electron impact relative ionization cross sections and fragmentation of U, UO, UO₂, and UO₃, *J. Chem. Phys.* **56**, 6156 (1972).
- [3596] Kordis, J., and Gingerich, K. A. Gaseous phosphorus compounds. VIII. Thermodynamic study of antimony monophosphide with a mass spectrometer, *J. Phys. Chem.* **76**, 2336 (1972).
- [3597] Cocke, D. L., and Gingerich, K. A. Mass spectrometric determination of the bond dissociation energies of the molecules CePd and CeC₂, *J. Phys. Chem.* **76**, 2332 (1972).
- [3598] Conde-Caprace, G., and Collin, J. E. Ionization and dissociation of cyclic ethers and thioethers by electron-impact. A comparison between 1,3-dioxolane, 1,3-dithiolane and 1,3-oxathiolane, *Org. Mass Spectrom.* **6**, 415 (1972).
- [3605] Wagner, L. C., and Grimley, R. T. A study of ionization processes by the angular distribution technique. The AgCl system, *J. Phys. Chem.* **76**, 2819 (1972).
- [3606] Uy, O. M., Srivastava, R. D., and Farber, M. Mass spectrometric determination of the heats of formation of the gaseous molecules AlOF₂ and AlF₃, *High Temp. Sci.* **4**, 227 (1972).
- [3607] Roberts, J. A., Jr., and Searcy, A. W. The stabilities of C₂F₄(g) and La₂F₆(g), *High Temp. Sci.* **4**, 411 (1972).
- [3608] Piacente, V., and Desideri, A. Mass spectrometric determination of the dissociation energy of GaBi molecule, *J. Chem. Phys.* **57**, 2213 (1972).
- [3609] Piacente, V., and Gingerich, K. A. Thermodynamic study of the molecule NaAg with a mass spectrometer, *High Temp. Sci.* **4**, 312 (1972).
- [3610] Hildenbrand, D. L. The gaseous equilibrium Ge + SiO = GeO + Si and the dissociation energy of SiO, *High Temp. Sci.* **4**, 244 (1972).
- [3611] Balducci, G., De Maria, G., and Guido, M. Mass spectrometric

- determination of the dissociation energy of $\text{EuC}_2(\text{g})$, *J. Chem. Phys.* **56**, 1431 (1972).
- [3612] Hariharan, A. V., and Eick, H. A. Vaporization thermodynamics of EuI_2 , *High Temp. Sci.* **4**, 379 (1972).
- [3613] Feather, D. H., Büchler, A., and Searcy, A. W. The vapor pressures of gallium trifluoride monomer and dimer, *High Temp. Sci.* **4**, 290 (1972).
- [3614] Hariharan, A. V., Fisluel, N. A., and Eick, H. A. Vaporization thermodynamics of YbCl_2 , *High Temp. Sci.* **4**, 405 (1972).
- [3615] Muenow, D. W., and Margrave, J. L. Mass spectrometric observations of gaseous phosphorus sulfides and oxysulfides, *J. Inorg. Nucl. Chem.* **34**, 89 (1972).
- [3616] Hildenbrand, D. L. Thermochemistry of the molecules CS and CS^+ , *Chem. Phys. Letters* **15**, 379 (1972).
- [3617] Farber, M., Srivastava, R. D., and Uy, O. M. Mass spectrometric determination of the thermodynamic properties of the vapour species from alumina, *J. Chem. Soc. Faraday Trans. I* **68**, 249 (1972).
- [3618] Guido, M., Balducci, G., and De Maria, G. Thermodynamics of rare-earth-carbon systems. IV. The lutetium-carbon system, *J. Chem. Phys.* **57**, 1475 (1972).
- [3619] Gingerich, K. A. Gaseous phosphorus compounds. VII. The dissociation energy and heat of formation of boron monophosphide, *J. Chem. Phys.* **56**, 4239 (1972).
- [3620] Farber, M., Uy, O. M., and Srivastava, R. D. Effusion-mass spectrometric determination of the heats of formation of the gaseous molecules V_2O_{10} , V_2O_5 , VO_2 , and VO , *J. Chem. Phys.* **56**, 5312 (1972).
- [3621] Gingerich, K. A., Pupp, C., and Camphell, B. E. Mass spectrometric determination of the heats of atomization of the molecules Ce_2S , CeS_2 , Ce_2S_2 , and Ce_2S_4 , *High Temp. Sci.* **4**, 236 (1972).
- [3622] Gräber, P., and Weil, K. G. Mass spectrometric investigations of silver halides I: mass spectrum, appearance potentials, and fragmentation scheme of silver chloride, *Ber. Bunsenges. Phys. Chem.* **76**, 410 (1972).
- [3623] Ehlert, T. C., and Hsia, M. Mass spectrometric and thermochemical studies of the manganese fluorides, *J. Fluorine Chem.* **2**, 33 (1972-73).
- [3624] Tajima, S., Shimizu, Y., and Tsuchiya, T. The effect of the shield voltage on appearance potential measurements using a mass spectrometer, *Bull. Chem. Soc. Japan* **45**, 931 (1972).
- [3625] Crowe, A., Preston, J. A., and McConkey, J. W. Ionization of argon by electron impact, *J. Chem. Phys.* **57**, 1620 (1972).
- [3626] Johnstone, R. A. W., and Mellon, F. A. Electron-impact ionization and appearance potentials, *J. Chem. Soc. Faraday Trans. II* **68**, 1209 (1972).
- [3627] Hvistendahl, G., and Undheim, K. Mass spectrometry of 'onium compounds. Part XIV. Methiodides of methyl pyridylacetates, *J. Chem. Soc., Perkin Trans. II* **14**, 2030 (1972).
- [3628] Flesch, G. D., Junk, G. A., and Svec, H. J. Ionization efficiency data and fragmentation mechanisms for ferrocene, nickelocene, and ruthenocene, *J. Chem. Soc. Dalton Trans.*, 1102 (1972).
- [3629] Lightner, D. A., Majeti, S., Nicoletti, R., and Thommen, E. Benzyl vs. tropylium ions in the electron impact induced decomposition of *n*-butylbenzenes, *Intra-Sci. Chem. Rep.* **6**, 113 (1972).
- [3630] Hvistendahl, G., and Undheim, K. Mass spectrometry of onium compounds. IX: on the evaporation of anilinium oxides. Ionization potential measurements, *Org. Mass Spectrom.* **6**, 217 (1972).
- [3631] Benezra, S. A., and Bursey, M. M. Hydrogen bonding in mass spectral activated complexes. A correction, *J. Chem. Soc., Perkin Trans. II* 1537 (1972).
- [3632] Foster, M. S., and Beauchamp, J. L. Gas-phase ion chemistry of azomethane by ion cyclotron resonance spectroscopy, *J. Am. Chem. Soc.* **94**, 2425 (1972).
- [3633] Dixon, D. A., Holtz, D., and Beauchamp, J. L. Acidity, basicity, and gas-phase ion chemistry of hydrogen selenide by ion cyclotron resonance spectroscopy, *Inorg. Chem.* **11**, 960 (1972).
- [3634] Hertzberg, M., White, G., Olfsky, R. S., and Saalfeld, F. E. Bisdifluoraminoalkanes: the mass spectral decomposition of isomeric propanes, *J. Phys. Chem.* **76**, 60 (1972).
- [3635] Gronneberg, T., and Undheim, K. Mass spectrometry of onium compounds. X: on the evaporation of pyridinium-3-oxides—ionization potential measurements, *Org. Mass Spectrom.* **6**, 225 (1972).
- [3636] Gronneberg, T., and Undheim, K. Mass spectrometry of onium compounds. XI: ionization potentials of hydroxy and mercapto pyridines, *Org. Mass Spectrom.* **6**, 823 (1972).
- [3637] Brundle, C. R., Robin, M. B., and Kuebler, N. A. Perfluoro effect in photoelectron spectroscopy. II. Aromatic molecules, *J. Am. Chem. Soc.* **94**, 1466 (1972).
- [3638] Brogli, F., Heilbronner, E., and Kobayashi, T. Photoelectron spectra of azabenzenes and azanaphthalenes: II. A reinvestigation of azanaphthalenes by high-resolution photoelectron spectroscopy, *Helv. Chim. Acta* **55**, 274 (1972).
- [3639] Åsbrink, L., Fridh, C., Jonsson, B. Ö., and Lindholm, E. Rydberg series in small molecules. XVII. Photoelectron, UV, mass and electron impact spectra of pyridazine, *Intern. J. Mass Spectrom. Ion Phys.* **8**, 229 (1972).
- [3640] Berkowitz, J., and Dehmer, J. L. Photoelectron spectroscopy of high-temperature vapors. II. Chemical bonding in the Group III monohalides, *J. Chem. Phys.* **57**, 3194 (1972).
- [3641] Basset, P. J., and Lloyd, D. R. Photoelectron spectra of halides. Part III. Trifluorides and oxide trifluorides of nitrogen and phosphorus, and phosphorus oxide trichloride, *J. Chem. Soc. Dalton Trans.* 248 (1972).
- [3642] Brundle, C. R., and Jones, G. R. Electronic structure of KrF_2 , studied by photoelectron spectroscopy, *J. Chem. Soc. Faraday Trans. II* **68**, 959 (1972).
- [3643] Brundle, C. R., Kuebler, N. A., Robin, M. B., and Basch, H. Ionization potentials of the tetraphosphorus molecule, *Inorg. Chem.* **11**, 20 (1972).
- [3644] Boschi, R., Murrell, J. N., and Schmidt, W. Photoelectron spectra of polycyclic aromatic hydrocarbons, *Faraday Discuss. Chem.* **54**, 116 (1972).
- [3645] Bergmark, T., Rahalais, J. W., Werme, L. O., Karlsson, L., and Sieghahn, K. High-resolution electron spectra of methane, thiophene, 2-bromothiophene, and 3-bromothiophene, *Electron Spectroscopy*, ed. D. A. Shirley (North-Holland Pub. Co., Amsterdam, 1972).
- [3646] Bock, H., and Solouki, B. The "sulfoxide bond", *Angew. Chem. Intern. Ed.* **11**, 436 (1972).
- [3647] Boekelheide, V., and Schmidt, W. A photoelectron spectroscopic study of a classically conjugated but orbitally unconjugated tris-bridged cyclophane: [2.2.2](1,3,5)cyclophane-1,9,17-triene, *Chem. Phys. Lett.* **17**, 410 (1972).
- [3648] Bock, H., and Wittel, K. Photoelectron spectra and molecular properties of *trans*-dihalogenoethylenes: substituent effects spin-orbit coupling, *J. Chem. Soc. Chem. Commun.* 602 (1972).
- [3649] Brundle, C. R., Robin, M. B., Kuebler, N. A., and Basch, H. Perfluoro effect in photoelectron spectroscopy. I. Nonaromatic molecules, *J. Am. Chem. Soc.* **94**, 1451 (1972).
- [3650] Berkowitz, J. Photoelectron spectroscopic studies with a cylindrical-mirror analyzer, in: *Electron Spectroscopy*, ed. D. A. Shirley (North-Holland Pub. Co., Amsterdam, 1972).
- [3651] Åsbrink, L., Fridh, C., Jonsson, B. Ö., and Lindholm, E. Rydberg series in small molecules. XVI. Photoelectron,

- UV, mass and electron impact spectra of pyrimidine, Intern. J. Mass Spectrom. Ion Phys. **8**, 215 (1972).
- [3652] Paine, R. T., Sodeck, G., and Stafford, F. E. Molecular beam mass spectra and pyrolyses of fluorophosphine-triborane(7) complexes. Formation and mass spectrum of triborane(7), Inorg. Chem. **11**, 2593 (1972).
- [3653] Saalfeld, F. E., McDowell, M. V., MacDiarmid, A. G., and Highsmith, R. E. Nature of the bonding between silicon and the cobalt tetracarbonyl group in silylcobalt tetracarbonyl. III. Mass spectral studies of trichlorosilyltrifluorophosphine cobalt carbonyl derivatives, Intern. J. Mass Spectrom. Ion Phys. **9**, 197 (1972).
- [3654] Carmichael, P. J., Gowenlock, B. G., and Johnson, C. A. F. Carbon-nitrogen bond dissociation energy values in C-nitrosocompounds, Intern. J. Chem. Kinet. **4**, 339 (1972).
- [3655] DeKock, R. L., Higginson, B. R., and Lloyd, D. R. Photoelectron spectra of halides. Part 6.—The spectra of SF₃Cl, BrF₃ and IF₃, Faraday Discuss. Chem. Soc. **54**, 84 (1972).
- [3656] Cradock, S., and Whiteford, R. A. Photoelectron spectra of the methyl, silyl and germyl derivatives of the group VI elements, J. Chem. Soc. Faraday Trans. II **68**, 281 (1972).
- [3657] Dewar, M. J. S., and Goodman, D. W. Photoelectron spectra of molecules. Part 5.—Polycyclic aromatic hydrocarbons, J. Chem. Soc. Faraday Trans. II **68**, 1784 (1972).
- [3658] Chizhov, Yu. V., Kleimenov, V. I., Medynskii, G. S., and Vilesov, F. I. Photoelectron spectroscopy study of benzene, Opt. Spektrosk. **33**, 661 (1972) [Engl. transl.: Opt. Spectry. (USSR) **33**, 365 (1972)].
- [3659] Chadwick, D., Frost, D. C., Katrib, A., McDowell, C. A., and McLean, R. A. N. Photoelectron spectra of some bromoethylenes and 2-bromopropene, Can. J. Chem. **50**, 2642 (1972).
- [3660] Cowan, D. O., Gleiter, R., Glemser, O., and Heilbronner, E. The photoelectron spectra of NSCl, NSF and NSF₃, Helv. Chim. Acta **55**, 2418 (1972).
- [3661] Cradock, S., Ebsworth, E. A. V., Savage, W. J., and Whiteford, R. A. Photoelectron spectra of some methyl, silyl and germyl amines, phosphines and arsines, J. Chem. Soc. Faraday Trans. II **68**, (1972).
- [3662] Cradock, S., and Rankin, D. W. H. Photoelectron spectra of PF₂H and some substituted difluorophosphines, J. Chem. Soc. Faraday Trans. II **68**, 940 (1972).
- [3663] Cradock, S., and Savage, W. The photoelectron spectrum and electronic structure of hexamethyl tungsten, Inorg. Nucl. Chem. Lett. **8**, 753 (1972).
- [3664] Collin, J. E., Delwiche, J., and Natalis, P. Autoionization observed by photoelectron spectrometry at different wavelengths, Electron Spectroscopy, ed. D. A. Shirley (North-Holland Publishing Co., Amsterdam, 1972) p. 401.
- [3665] Dixon, R. N., Duxbury, G., Fleming, G. R., and Hugo, J. M. V. The photoelectron spectrum of thiazyl fluoride, Chem. Phys. Lett. **14**, 60 (1972).
- [3666] DeKock, R. L., Lloyd, D. R., Breeze, A., Collins, G. A. D., Cruickshank, D. W. J., and Lempka, H. J. Photoelectron spectroscopy and ab initio LCAO MO SCF calculations on thiazyl fluoride, Chem. Phys. Lett. **14**, 52 (1972).
- [3667] Chadwick, D. Photoelectron spectra of phosgene and thiophosgene, Can. J. Chem. **50**, 737 (1972).
- [3668] Clark, P. A., and Brogli, F., and Heilbronner, E. The π -orbital energies of the acenes, Helv. Chim. Acta **55**, 1415 (1972).
- [3669] Cox, P. A., Evans, S., Orchard, A. F., Richardson, N. V., and Roberts, P. J. Simple quantitative molecular orbital methods used in connection with photoelectron spectroscopy, Faraday Discuss. Chem. Soc. **54**, 26 (1972).
- [3670] Cradock, S., Ebsworth, E. A. V., and Murdoch, J. D. Photoelectron spectra of some Group 4 pseudohalides and related compounds, J. Chem. Soc. Faraday Trans. II **68**, 86 (1972).
- [3671] Cornford, A. B., Frost, D. C., Herring, F. G., and McDowell, C. A. Photoelectron spectra of some free radicals, Faraday Discuss. Chem. Soc. **54**, 56 (1972).
- [3672] Blake, A. J. Photoionization study of mercury by photoelectron spectroscopy, Proc. Roy. Soc. (London) **325**, 555 (1971).
- [3673] Bock, H., and Fuss, W. Arguments concerning the orbital sequence in borazin, Angew. Chem. Intern. Ed. **10**, 182 (1971).
- [3674] Plotnikov, V. F., Bogolyubov, G. M., Maretina, I. A., and Petrov, A. A. Organic derivatives of elements of Groups V and VI. V. Mass spectra of 1-buten-3-ynylamines, Zh. Org. Khim. **5**, 1157 (1969) [Engl. transl.: J. Org. Chem. USSR **5**, 1137 (1969)].
- [3675] DeKock, R. L., Lloyd, D. R., Hillier, I. H., and Saunders, V. R. Experimental and theoretical study of the electronic structures of sulphuryl fluoride and perchloryl fluoride, Proc. Roy. Soc. (London) **328**, 401 (1972).
- [3676] Evans, S. General discussion, Faraday Discuss. Chem. Soc. **54**, 143 (1972).
- [3677] Evans, S., Green, J. C., Joachim, P. J., Orchard, A. F., Turner, D. W., and Maier, J. P. Electronic structures of the Group IV_B tetramethyls by helium-(I) photoelectron spectroscopy, J. Chem. Soc. Faraday Trans. II **68**, 905 (1972).
- [3678] Frost, D. C., Herring, F. G., Katrib, A., McDowell, C. A., and McLean, R. A. N. Photoelectron spectra of CH₃SH, (CH₃)₂S, C₆H₅SH, and C₆H₅CH₂SH; the bonding between sulfur and carbon, J. Phys. Chem. **76**, 1030 (1972).
- [3679] Gleiter, R., Heilbronner, E., and Hornung, V. Photoelectron spectra of azabenzenes and azanaphthalenes: I. Pyridine, diazines *s*-triazine and *s*-tetrazine, Helv. Chim. Acta **55**, 255 (1972).
- [3680] DeKock, R. L., Higginson, B. R., Lloyd, D. R., Breeze, A., Cruickshank, D. W. J., and Armstrong, D. R. Photoelectron spectra of halides. V. Experimental and theoretical study of the electronic structures of ClF, ClF₃, BrF and BrF₃, Mol. Phys. **24**, 1059 (1972).
- [3681] Evans, S., Hamnett, A., and Orchard, A. F. The relative orbital energies of metal and ligand electrons in some tris(hexafluoroacetylacetonato) transition-metal complexes, J. Coord. Chem. **2**, 57 (1972).
- [3682] Evans, S., Hamnett, A., Orchard, A. F., and Lloyd, D. R. Study of the metal-oxygen bond in simple tris-chelate complexes by He(I) photoelectron spectroscopy, Faraday Discuss. Chem. Soc. **54**, 227 (1972).
- [3683] Evans, S., Joachim, P. J., Orchard, A. F., and Turner, D. W. A study of the orbital electronic structure of the P₄ molecule by photoelectron spectroscopy, Intern. J. Mass Spectrom. Ion Phys. **9**, 41 (1972).
- [3684] Eland, J. H. D. Photoelectron spectra and ionization potentials of aromatic hydrocarbons, Intern. J. Mass Spectrom. Ion Phys. **9**, 214 (1972).
- [3685] Heilbronner, E., Hornung, V., Pinkerton, F. H., and Thames, S. F. 31. Photoelectron spectra of azabenzenes and azanaphthalenes: III. The orbital sequence in methyl- and trimethylsilyl- substituted pyridines, Helv. Chim. Acta **55**, 289 (1972).
- [3686] Evans, S., Green, J. C., and Jackson, S. E. He(I) photoelectron spectra of some π -arene complexes, J. Chem. Soc. Faraday Trans. II **68**, 249 (1972).
- [3687] Heilbronner, E., and Martin, H. D. The π -orbital sequence in norbornadiene and related hydrocarbons, Helv. Chim. Acta **55**, 1490 (1972).
- [3688] Evans, S., Green, M. L. H., Jewitt, B., Orchard, A. F., and Pygall, C. F. Electronic structure of metal complexes containing π -cyclopentadienyl and related ligands, J.

- [3690] Frost, D. C., Lee, S. T., and McDowell, C. A. The high resolution photoelectron spectrum of CS, *Chem. Phys. Letters* **17**, 153 (1972).
- [3691] Jonathan, N., Morris, A., Okuda, M.; Ross, K. J., and Smith, D. J. Photoelectron spectroscopy of transient species. The CS molecule, *Faraday Discuss. Chem. Soc.* **54**, 48 (1972).
- [3692] McDowell, C. A. General Discussion, *Faraday Discuss. Chem. Soc.* **54**, 68 (1972).
- [3693] Herring, F. G. General Discussion, *Faraday Discuss. Chem. Soc.* **54**, 68 (1972).
- [3694] Chadwick, D., Cornford, A. B., Frost, D. C., Herring, F. G., Katrih, A., McDowell, C. A., and McLean, R. A. N. Photoelectron spectra of some dihalocompounds, in *Electron Spectroscopy*, ed. D. A. Shirley (North-Holland Publishing Co., Amsterdam, 1972) p. 453.
- [3695] Potts, A. W., Glenn, K. G., and Price, W. C. General Discussion, *Faraday Discuss. Chem. Soc.* **54**, 65 (1972).
- [3696] King, G. H., Kroto, H. W., and Suffolk, R. J. The photoelectron spectrum of a short-lived species in the decomposition products of CS₂, *Chem. Phys. Letters* **13**, 457 (1972).
- [3697] Kroto, H. W., and Suffolk, R. J. The photoelectron spectrum of an unstable species in the pyrolysis products of dimethyldisulphide, *Chem. Phys. Letters* **15**, 545 (1972).
- [3698] Morris, A. General Discussion, *Faraday Discuss. Chem. Soc.* **54**, 64 (1972).
- [3699] Lloyd, D. R., and Lynaugh, N. Photoelectron studies of boron compounds. Part 3. Complexes of borane with Lewis bases, *J. Chem. Soc. Faraday Trans. II* **68**, 947 (1972).
- [3700] Potts, A. W., Glenn, K. G., and Price, W. C. General Discussion, *Faraday Discuss. Chem. Soc.* **54**, 64 (1972).
- [3701] Jonathan, N., Morris, A., Okuda, M., and Smith, D. J. Electron spectroscopy of transient species, *Electron Spectroscopy*, ed. D. A. Shirley (North-Holland Pub. Co., Amsterdam, 1972) p. 345.
- [3702] Maier, J. P., and Turner, D. W. Steric inhibition of resonance studied by molecular photoelectron spectroscopy. Part I. Biphenyls, *Faraday Discuss. Chem. Soc.* **54**, 149 (1972).
- [3703] Maier, J. P., and Turner, D. W. Photoelectron spectroscopy and the geometry of the phosphine and phosphorous trifluoride molecular ions, *J. Chem. Soc. Faraday Trans. II* **68**, 711 (1972).
- [3704] King, G. H., Krishnamurthy, S. S., Lappert, M. F., and Pedley, J. B. Bonding studies of compounds of boron and the Group 4 elements. Part 9. Photoelectron spectra and bonding studies of halogeno-, dimethylamino-, and methyl-boranes, BX₃ and BX₂Y, *Faraday Discuss. Chem. Soc.* **54**, 70 (1972).
- [3705] Mines, G. W., Thomas, R. K., and Thompson, H. Photoelectron spectra of compounds containing thionyl and sulphuryl groups, *Proc. Roy. Soc. (London)* **A329**, 275 (1972).
- [3707] King, G. H., Murrell, J. N., and Suffolk, R. J. The vacuum-ultraviolet photoelectron spectra of fluoropyridines, *J. Chem. Soc. Dalton Trans.*, 564 (1972).
- [3708] Kroto, H. W., and Suffolk, R. J. The photoelectron spectrum of F₂CS and fluorine substitution shifts, *Chem. Phys. Letters* **17**, 213 (1972).
- [3709] Lynaugh, N., Lloyd, D. R., Guest, M. F., Hall, M. B., and Hillier, I. H. Photoelectron studies of boron compounds. Part 4. Experimental and theoretical studies of dihoron tetrachloride and dihoron tetrafluoride, *J. Chem. Soc. Faraday Trans. II* **68**, (1972).
- [3710] Murrell, J. N., and Schmidt, W. Photoelectron spectroscopic correlation of the molecular orbitals of methane, ethane, propane, isobutane and neopentane, *J. Chem. Soc. Faraday Trans. II* **68**, 1709 (1972).
- [3711] Lloyd, D. R., and Lynaugh, N. Photoelectron spectra of the bis-(π -allyl) complexes of nickel and palladium, *Electron Spectroscopy*, ed. D. A. Shirley (North-Holland Pub. Co., Amsterdam, 1972) p. 445.
- [3712] Morishima, I., Yoshikawa, K., Yonezawa, T., and Matsumoto, H. Photoelectron spectral studies of organic free radicals. The nitroxide radical, *Chem. Phys. Letters* **16**, 336 (1972).
- [3713] Klessinger, M. Ionization potentials of substituted benzenes, *Angew. Chem. Intern. Ed.* **11**, 525 (1972).
- [3714] Okuda, M. General Discussion, *Faraday Discuss. Chem. Soc.* **54**, 140 (1972).
- [3716] Potts, A. W., and Price, W. C. The photoelectron spectra of methane, silane germane and stannane, *Proc. Roy. Soc. (London)* **A165**, (1972).
- [3717] Jonathan, N. General Discussion, *Faraday Discuss. Chem. Soc.* **54**, 64 (1972).
- [3718] Sweigart, D. A., and Turner, D. W. Lone pair orbitals and their interactions studied by photoelectron spectroscopy. I. Carboxylic acids and their derivatives, *J. Am. Chem. Soc.* **94**, 5592 (1972).
- [3719] Potts, A. W., and Price, W. C. Photoelectron spectra and valence shell orbital structures of groups V and VI hydrides, *Proc. Roy. Soc. (London)* **A326**, 181 (1972).
- [3720] Fridh, C., Åsbrink, L., Jonsson, B. O., and Lindholm, E. Rydberg series in small molecules. XIV. Photoelectron, UV, mass and electron impact spectra of s-triazine, *Intern. J. Mass Spectrom. Ion Phys.* **8**, 85 (1972).
- [3721] Rabalais, J. W. Photoelectron spectroscopic investigation of the electronic structure of nitromethane and nitrobenzene, *J. Chem. Phys.* **57**, 960 (1972).
- [3722] Van Den Ham, D. M. W., and Van Der Meer, D. The photoelectron spectra of the diazanaphthalenes, *Chem. Phys. Letters* **12**, 447 (1972).
- [3723] Van Den Ham, D. M. W., and Van Der Meer, D. Perfluoro effect in the photoelectron spectra of quinoline and isoquinoline, *Chem. Phys. Letters* **15**, 549 (1972).
- [3724] Palmer, M. H., and Findlay, R. H. Ab initio molecular orbital calculations, the electronic structure and electron spectrum of norbornadiene, *Chem. Phys. Letters* **15**, 416 (1972).
- [3725] Rabalais, J. W., Werme, L. O., Bergmark, T., Karlsson, L., Hussain, M., and Siegbahn, K. Electron spectroscopy of open-shell systems: spectra of Ni(C₂H₃)₂, Fe(C₂H₃)₂, Mn(C₂H₃)₂, and Cr(C₂H₃)₂, *J. Chem. Phys.* **57**, 1185 (1972).
- [3726] Thomas, R. K., Thompson, H. Photoelectron spectra of carbonyl halides and related compounds, *Proc. Roy. Soc. (London)* **A327**, 13 (1972).
- [3727] Robin, M. B., Brundle, C. R., Kuebler, N. A., Ellison, G. B., and Wiberg, K. B. Photoelectron spectra of small rings. IV. The unsaturated three-membered rings, *J. Chem. Phys.* **57**, 1758 (1972).
- [3728] Rabalais, J. W., Bergmark, T., Werme, L. O.; Karlsson, L., Hussain, M., and Siegbahn, K. The high-resolution electron spectrum of carbon suboxide, *Electron Spectroscopy*, ed. D. A. Shirley (North-Holland Pub. Co., Amsterdam, 1972), p. 425.
- [3729] Adamchuk, V. K., Dmitriev, A. B., Prudnikova, G. V., and Sorokin, L. S. Photoionization of low-volatility molecules in a geiger counter, *Opt. Spektrosk.*, **33**, 358 (1972) [Eng. transl. *Opt. Spectrosc. USSR* **33**, 191 (1972)].
- [3730] Daisey, J. M., and Sonnessa, A. J. A study of the thermodynamic and spectral properties of molecular complexes of iodine with several aminopyridines, *J. Phys. Chem.* **76**, 1895 (1972).
- [3731] DiLorenzo, G., Galloni, G., Trombetti, A., and Zauli, C. Electronic spectrum of thiophen and some deuterated thiophens, *J. Chem. Soc. Faraday Trans. II* **68**, 2009 (1972).
- [3732] Lossing, F. P. Free radicals by mass spectrometry. XLIV.

- Ionization potentials and bond dissociation energies for chloro- and fluoromethyl radicals, *Bull. Soc. Chim. Belges* **81**, 125 (1972).
- [3733] Sweigart, D. A., and Turner, D. W. Lone pair orbitals and their interactions studied by photoelectron spectroscopy. II. Equivalent orbitals in saturated oxygen and sulfur heterocycles, *J. Am. Chem. Soc.* **94**, 5599 (1972).
- [3734] Thomas, R. K. Photoelectron spectroscopy of hydrogen-bonded systems: spectra of monomers, dimers and mixed complexes of carboxylic acids, *Proc. Roy. Soc. (London)* **A331**, 249 (1972).
- [3735] Gross, M. L. Ion cyclotron resonance spectrometry. A means of evaluating kinetic shifts, *Org. Mass Spectrom.* **6**, 827 (1972).
- [3736] Salmona, Y. F., and Vincent, E.-J. Études expérimentales et théoriques de potentiels d'ionisation de dérivés de la série de l'isothiazole, *C. R. Acad. Sci., Ser. C* **273**, 863 (1971).
- [3737] Lageot, C. Étude des états excités de l'ion HCN^+ , *J. Chim. Phys. Phys.-Chim., Biol.* **68**, 214 (1972).
- [3738] Wanczek, K.-P., Lebert, K.-H., and Hartmann, H. Untersuchung der Ion-Molekül-Reaktionen des Thiothionylfluorids mit Hilfe der Ionen-Cyclotronresonanz-Spektrometrie, *Z. Naturforsch.* **27a**, 155 (1972).
- [3739] Mason, D. C., Kuppermann, A., and Mintz, D. M. Angular distribution of electrons from the photoionization of ethylene, in *Electron Spectroscopy*, ed. D. A. Shirley (North Holland, Amsterdam, 1972) p. 269.
- [3740] Fridh, C., Åsbrink, L., Jonsson, B. Ö., and Lindholm, E. Rydberg series in small molecules XVIII. Photoelectron, UV, mass, and electron impact spectra of *s*-tetrazine, *Intern. J. Mass Spectrom. Ion Phys.* **9**, 485 (1972).
- [3741] Haselbach, E., Heilbronner, E., Musso, H., and Schmelzer, A. Notiz über die Photoelektronen-Spektren des Nortricyclens und des Triasterans, *Helv. Chim. Acta* **55**, 302 (1972).
- [3742] Donovan, R. J., Little, D. J., and Konstantatos, J. Vacuum ultraviolet spectra of transient molecules and radicals, *J. Chem. Soc. Faraday Trans. II* **68**, 1812 (1972).
- [3743] Gole, J. L., and Margrave, J. L. The vacuum ultraviolet spectrum of molecular fluorine, *J. Mol. Spectry.* **43**, 65 (1972).
- [3745] Cabaud, B., Hoareau, A., Nounou, P., and Uzan, R. Étude des processus d'ionisation à haute température des vapeurs métalliques par couplage d'une cellule de knudsen et d'une source fox. II. Interprétation des processus d'autoionisation des vapeurs métalliques monoatomiques et influence de la température sur les courbes d'efficacité d'ionisation, *Int. J. Mass Spectrom. Ion Phys.* **8**, 181 (1972).
- [3746] Witel, K., Hass, A., and Bock, H. Photoelektronenspektren und Moleküleigenschaften, XVI. Thiocarbonylhalogenide-Orbitale und Ladungen, *Chem. Ber.* **105**, 3865 (1972).
- [3747] Barz, P., and Fritz, H. P. Untersuchungen an biochemischen Ligandensystemen. V. Komplexchemische und physikalisch-chemische Untersuchungen am 1,2-Dimethylhydrazin, *Z. Naturforsch.* **27b**, 1131 (1972).
- [3748] Boschi, R. A., and Salahub, D. R. The far ultra-violet spectra of some 1-iodoalkanes, *Mol. Phys.* **24**, 289 (1972).
- [3749] Doucet, J., Sauvageau, P., and Sandorfy, C. The vacuum ultraviolet spectrum of tetrahydrofuran, *Chem. Phys. Letters* **17**, 316 (1972).
- [3750] Fridh, C., Åsbrink, L., Jonsson, B. Ö., and Lindholm, E. Rydberg series in small molecules. XV. Photoelectron, UV, mass and electron impact spectra of pyrazine, *Intern. J. Mass Spectrom. Ion Phys.* **8**, 101 (1972).
- [3751] Salahub, D. R., and Boschi, R. A. The far ultraviolet spectrum of iodoacetylene, *Chem. Phys. Letters* **16**, 320 (1972).
- [3752] Sergeev, Yu. L., Akopyan, M. E., and Vilesov, F. I. Photoionization of the phenyl radical, *Opt. Spektrosk.* **32**, 230 (1972) [Engl. transl.: *Opt. Spectry. (USSR)* **32**, 121 (1972)].
- [3753] Stebbings, W. L., and Taylor, J. W. Photoionization mass spectrometry. II. Contrasting fragmentation of toluene by photons and by electrons, *Intern. J. Mass Spectrom. Ion Phys.* **9**, 471 (1972).
- [3754] Kaufman, V., and Minnhagen, L. Accurate ground-term combinations in NeI, *J. Opt. Soc. Am.* **62**, 92 (1972).
- [3755] Narayan, B. Spectra and ionization potential of cyanoacetylene, *Proc. Indian Acad. Sci. A* **75**, 92 (1972).
- [3756] Radziemski, L. J., and Kaufman, V. New wavelengths and energy levels in the spectrum of singly ionized chlorine (Cl II), *J. Opt. Soc. Am.* **62**, 1371 (1972).
- [3757] Raymond, J. W. Rydberg states in cyclic alkanes, *J. Chem. Phys.* **56**, 3912 (1972).
- [3758] Pitt, C. G., Carey, R. N., and Toren, E. C. Nature of the electronic interactions in aryl-substituted polysilanes, *J. Am. Chem. Soc.* **94**, 3806 (1972).
- [3759] Nishida, S., Moritani, I., and Teraji, T. Ionization potentials of cyclopropylethylenes, *J. Chem. Soc. Chem. Commun.*, 1114 (1972).
- [3760] Ogawa, M., and Ogawa, S. Absorption spectrum of CO in the Hopfield helium continuum region, 600–1020 Å, *J. Mol. Spectry.* **41**, 393 (1972).
- [3761] Narayana, B., and Price, W. C. Ionization of the σ^*2s orbital of NO and configuration interaction effects on the spin-split states arising from inner orbital ionization in paramagnetic molecules, *J. Phys. B* **5**, 1784 (1972).
- [3762] Ackermann, F., Lefebvre-Brion, H., and Roche, A. L. Calculated Rydberg states of the PO molecule, *Can. J. Phys.* **50**, 692 (1972).
- [3763] Takezawa, S., and Tanaka, Y. Absorption spectrum of HD in the vacuum-uv region. Rydberg states and ionization energy, *J. Chem. Phys.* **56**, 6125 (1972).
- [3764] Gilbert, R., Sauvageau, P., and Sandorfy, C. Far-UV and photoelectron spectra of 1,3,5-trifluorobenzene, *Chem. Phys. Letters* **17**, 465 (1972).
- [3765] Vilesov, F. I. The photoionization of vapors of compounds whose molecules contain carbonyl groups, *Dokl. Akad. Nauk SSSR* **132**, 1332 (1960) [Engl. transl.: *Dokl. Phys. Chem.* **132**, 521 (1960)].
- [3766] Akopyan, M. E., and Loginov, Yu. V. Mass-spectrometric study of the photoionization of free α -aminoacids, *Khim. Vys. Energ.* **1**, 97 (1967) [Engl. transl.: *High Energy Chem.* **1**, 83 (1967)].
- [3767] Polyakova, A. A., Zimina, K. I., Petrov, A. A., and Khmel'nitskii, R. A. Mass spectra and the structure of vinylacetylenes, *Dokl. Akad. Nauk SSSR* **127**, 386 (1959) [Engl. transl.: *Dokl. Phys. Chem.* **127**, 597 (1959)].
- [3768] Velasco, R. Espectro ultravioleta de la molecula Li_2 , *An. R. Soc. Esp. Fis. Quim.* **175**, (1960).
- [3769] Gil'burd, M. M., Syrvatka, B. G., Shevchuk, V. U., Bel'ferman, A. L., and Moin, F. B. Mass spectrometric study of fluorine-containing compounds. I. Comparative study of methylacetylene and difluoromethylacetylene, *Khim. Vys. Energ.* **1**, 411 (1967) [Engl. transl.: *High Energy Chem.* **1**, 359 (1967)].
- [3770] Herzberg, G., and Jungen, Ch. Rydberg series and ionization potential of the H_2 molecule, *J. Mol. Spectry.* **41**, 425 (1972).
- [3772] Marr, G. V., and Wherrett, S. R. The ionization of caesium vapour by the method of space charge amplification, *J. Phys. B* **5**, 1735 (1972).
- [3773] Scheps, R., Florida, D., and Rice, S. A. Comments on the Rydberg spectrum of pyrazine, *J. Mol. Spectry.* **44**, 1 (1972).
- [3774] Iverson, A. A., and Russell, B. R. A medium resolution study of allene in the vacuum ultraviolet. I. Spectra and a

preliminary ionization potential, *Spectrochim. Acta* **28A**, 447 (1972).

- [3775] Neckel, A., and Sodeck, G. Bestimmung der Dissoziationsenergien der gasförmigen Moleküle CuGe, AgGe und AuGe, *Monatsh. Chem.* **103**, 367 (1972).
- [3776] Scott, J. D., and Russell, B. R. Vacuum-ultraviolet spectral studies of several chlorofluoroethylenes, *J. Am. Chem. Soc.* **94**, 2634 (1972).
- [3777] Tajima, S., and Tsuchiya, T. The effects of the repeller voltage and the shield voltage on appearance potential measurements by electron impact, *Shitsugo Bunseki* **20**, 117 (1972).
- [3778] Bock, H., and Stafast, H. Photoelektronenspektren und Moleküleigenschaften, IX. Die π -Systeme der *cis*- und *trans*-Dicyan-äthylene, *Chem. Ber.* **105**, 1158 (1972).
- [3779] Ferreira, M. A. A., and Costa, M. L. Impacto eletrônico no oxi-sulfureto de carbono: potenciais de aparecimento de iões positivos, calores de formação e energias de dissociação, *Rev. Port. Quim.*, **14**, 21 (1972).
- [3780] Brogli, F., Heilbronner, E., and Ipaktschi, J. Die Wechselwirkung zwischen *Walsh*- und π -Orbitalen im 7-Cyclopropylden-norbornadien, *Helv. Chem. Acta* **55**, 2447 (1972).
- [3781] Bock, H., Wagner, G., and Kroner, J. Photoelektronenspektren und Moleküleigenschaften, XIV. Die Delokalisation des Schwefel-Elektronenpaares in CH_3S -substituierten Aromaten, *Chem. Ber.* **105**, 3850 (1972).
- [3782] Schmidbaur, H., and Vornberger, W. Die Organosiliciumchemie der Phosphor-Ylide, XVI. Si-Si-Struktureinheiten als Carbanion-Substituenten in Yliden, *Chem. Ber.* **105**, 3173 (1972).
- [3783] Preiss, H. Massenspektrometrische Untersuchungen an einigen Halogeniden der 5. Haupt- und Nebengruppe, *Z. Anorg. Allg. Chem.* **389**, 280 (1972).
- [3784] Bentley, T. W., Johnstone, R. A. W., and McMaster, B. N. Appearance potentials of metastable and normal ions and the kinetic shift, *J. Chem. Soc. Chem. Commun.*, 510 (1973).
- [3785] Foner, S. N., and Hudson, R. L. Mass spectrometric studies of tetrafluorohydrazine and the difluoroamino radical, *J. Chem. Phys.* **58**, 581 (1973).
- [3786] Gaivoronskii, P. E., Larin, N. V., Sirotkin, N. I., Artemov, A. N., and Shushunov, N. V. Study of arenechromium tricarbonyl complexes by mass spectrometry, *Izv. Akad. Nauk SSSR, Ser. Khim.* **11**, 2618 (1973) [Engl. transl.: *Bull. Acad. Sci. USSR, Div. Chem. Sci.* **22**, 2557 (1973)].
- [3787] Aloisi, G. G., and Pignataro, S. Molecular complexes of substituted thiophenes with σ and π acceptors, *J. Chem. Soc. Faraday Trans. 1* **69**, 534 (1973).
- [3788] Gilbert, J. R., Leach, W. P., and Miller, J. R. Ionisation and appearance potential measurements in arene chromium tricarbonyls, *J. Organometal. Chem.* **49**, 219 (1973).
- [3789] Hvistendahl, G., Undheim, K., and Györfi, P. Mass spectrometry of tropylium halides, *Org. Mass Spectrom.* **7**, 903 (1973).
- [3790] Gross, M. L., and Aerni, R. J. The unusual loss of hydrogen from ionized 1,5-hexadiyne, *J. Am. Chem. Soc.* **95**, 7875 (1973).
- [3791] Flesch, G. D., and Svec, H. J. Fragmentation reactions in the mass spectrometer for C_2 - C_5 alkanes, *J. Chem. Soc. Faraday Trans. 1* **69**, 1187 (1973).
- [3792] Benoit, F. The benzoyl cation: The participation of isolated electronic excited states in the dissociation of molecular ions of the form $[\text{C}_6\text{H}_5\text{COX}]^+$, *Org. Mass Spectrom.* **7**, 1407 (1973).
- [3793] Begun, G. M., and Compton, R. N. Electron impact ionization studies of ferrocene, cobaltocene, nickelocene, and magnesocene, *J. Chem. Phys.* **58**, 2271 (1973).
- [3794] Branton, G. R., and Pua, C. K. N. Low energy electron impact ionization and fragmentation—cyclobutanone, *Can. J. Chem.* **51**, 624 (1973).
- [3795] Ackermann, R. J., and Rauh, E. G. The preparation and characterization of the metastable monoxides of thorium and uranium, *J. Inorg. Nucl. Chem.* **35**, 3787 (1973).
- [3796] Cuthill, A. M., Fabian, D. J., and Shu-Shou-Shen, S. Bond dissociation energies of the metallic vapor species aluminum-silver and aluminum-gold measured by Knudsen-cell mass spectrometry, *J. Phys. Chem.* **77**, 2008 (1973).
- [3797] Crowe, A., and McConkey, J. W. Dissociative ionization by electron impact II. N^+ and N^{++} from N_2 , *J. Phys. B (Proc. Phys. Soc.)* **6**, 2108 (1973).
- [3798] Cocke, D. L., Gingerich, K. A., and Kordis, J. Mass spectrometric observation of gaseous EuCN and the determination of its atomization energy, *J. Chem. Soc. Chem. Commun.* 561 (1973).
- [3799] Crowe, A., and McConkey, J. W. Dissociative ionization by electron impact. I. Protons from H_2 , *J. Phys. B (Proc. Phys. Soc.)* **6**, 2088 (1973).
- [3800] Ciach, S., Knowles, D. J., Nicholson, A. J. C., and Swingler, D. L. Vaporization of tin(II) halides. I. Stannous chloride and stannous bromide, *Inorg. Chem.* **12**, 1443 (1973).
- [3801] Farber, M., and Srivastava, R. D. Effusion-mass spectrometric study of thermodynamic properties of vanadium and vanadium nitride, *J. Chem. Soc. Faraday Trans. 1* **69**, 390 (1973).
- [3802] Ciach, S., Nicholson, A. J. C., Swingler, D. L., and Thistlethwaite, P. J. Mass spectrometric study of the vapor phase over neodymium chloride and gadolinium chloride, *Inorg. Chem.* **12**, 2072 (1973).
- [3803] Jalonen, J., Pasanen, P., and Pihlaja, K. Ionisation and appearance potentials in the evaluation of nonbonded interactions. IV: Conformational effects in methyl-substituted 1,3-oxathianes, *Org. Mass Spectrom.* **7**, 949 (1973).
- [3804] Distefano, G., Pignataro, S., Innorta, G., Fringuelli, F., Marino, G., and Taticchi, A. Ionization energies of selenophen, tellurophen and some of their derivatives, *Chem. Phys. Letters* **22**, 132 (1973).
- [3805] Rakita, P. E., Hoffman, M. K., Andrews, M. N., and Bursey, M. M. σ - π Conjugation in group IVA compounds of indene and indane, *J. Organometal. Chem.* **49**, 213 (1973).
- [3806] Pignataro, S., Mancini, V., Innorta, G., and Distefano, G. Ionization energies and ring orbital interaction in diarylmethanes and diarylethanes, *Z. Naturforsch.* **27**, 534 (1972).
- [3807] Innorta, G., Torrioni, S., Pignataro, S., and Mancini, V. The activation energy as guiding factor in the fragmentation of substituted diphenylmethanes, *Org. Mass Spectrom.* **7**, 1399 (1973).
- [3808] Sen Sharma, D. K., and Franklin, J. L. Heats of formation of free radicals by mass spectrometry, *J. Am. Chem. Soc.* **95**, 6562 (1973).
- [3809] Smolinsky, G., and Vasile, M. J. Mass spectra of vinyltrimethylsilane and vinyltri(methyl- d_3)silane, *Org. Mass Spectrom.* **7**, 1069 (1973).
- [3810] Muenow, D. W. Mass spectrometric evidence for the gaseous silicon oxide nitride molecule and its heat of atomization, *J. Phys. Chem.* **77**, 970 (1973).
- [3811] Morrison, J. D., and Traeger, J. C. Ionization and dissociation by electron impact. II. NH_3 and PH_3 , *Intern. J. Mass Spectrom. Ion Phys.* **11**, 277 (1973).
- [3812] Momigny, J., Mathieu, G., Wankenne, H., and Ferreira, M. A. A. Collision- and non-collision-induced predissociation in the appearance of S^+ and CS^+ ions from CS_2 under electron impact, *Chem. Phys. Letters* **21**, 606 (1973).
- [3813] Morrison, J. D., and Traeger, J. C. Ionization and dissociation by electron impact. III. CH_4 and SiH_4 , *Intern. J. Mass Spectrom. Ion Phys.* **11**, 289 (1973).

- [3814] Saalfeld, F. E., McDowell, M. V., DeCorpo, J. J., Berry, A. D., and MacDiarmid, A. G. Mass spectral studies of some manganese carbonyls, *Inorg. Chem.* **12**, 43 (1973).
- [3815] Glockling, F., Morrison, R. J., and Wilson, J. W. Diphenylberyllium: electron impact and calorimetric studies, *J. Chem. Soc. Dalton Trans.* 94 (1973).
- [3816] Hildenbrand, D. L. Dissociation energies of the molecules AlO and Al_2O , *Chem. Phys. Letters* **20**, 127 (1973).
- [3817] Henion, J. D., and Kingston, D. G. I. Mass spectrometry of organic compounds. VII. Energetics of substituent isomerization in diphenyl sulfide and diphenyl ether, *J. Am. Chem. Soc.* **95**, 8358 (1973).
- [3818] Hildenbrand, D. L. Mass spectrometric studies of some gaseous sulfur fluorides, *J. Phys. Chem.* **77**, 897 (1973).
- [3819] Drowart, J., Myers, C. E., Swarc, R., Vander Auwera-Mahieu, A., and Uy, O. M. Determination by the mass spectrometric Knudsen cell method of the atomization energies of the molecules PO and PO_2 , *J. Chem. Soc. Faraday Trans. II* **68**, 1749 (1972).
- [3820] Hirayama, C., and Castle, P. M. Mass spectra of rare earth triiodides, *J. Phys. Chem.* **77**, 3110 (1973).
- [3821] Panchenkov, I. G., Gusarov, A. V., and Gorokhov, L. N. Dissociation energy of the barium oxide molecule, *Zh. Fiz. Khim.* **47**, 101 (1973) [Engl. transl. *Russ. J. Phys. Chem.* **47**, 55 (1973)].
- [3822] Condorelli, G., Fragalà, I., Centineo, G., and Tondello, E. The electronic structure and photoelectron spectra of Ni^{II} , Cu^{II} and Pd^{II} complexes with $\text{N,N}'$ -ethylene-bis(acetylacetoniminato) dianion, *Inorg. Chim. Acta* **7**, 725 (1973).
- [3823] Scheppele, S. E., Mitchum, R. K., Kinneberg, K. F., Meisels, G. G., and Emmel, R. H. Internal energy distributions and the fragmentation of gaseous organic ions. Dissociation of ions produced by electron impact on 4-methylbenzil, *J. Am. Chem. Soc.* **95**, 5105 (1973).
- [3824] Cowling, S. A., Johnstone, R. A. W., Gorman, A. A., and Smith, P. G. Photoelectron spectrum of 5-methylenenorborn-2-ene and through-space interactions (homobutadiene conjugation), *J. Chem. Soc. Chem. Commun.* 627 (1973).
- [3825] Cowley, A. H., Dewar, M. J. S., Goodman, D. W., Schweiger, J. R. Stereochemical dependence of lone pair interactions in the photoelectron spectra of nitrogen-phosphorus compounds, *J. Am. Chem. Soc.* **95**, 6506 (1973).
- [3826] Bain, A. D., and Frost, D. C. Studies of the carbonyl group in some five-membered ring compounds by photoelectron spectroscopy, *Can. J. Chem.* **51**, 1245 (1973).
- [3827] Cradock, S., Ebsworth, E. A. V., and Robertson, A. Photoelectron spectra of some silyl and germyl transition-metal carbonyls and related species, *J. Chem. Soc. Dalton Trans.* 22 (1973).
- [3828] Boyd, R. J., Bünzli, J. C., Snyder, J. P., and Heyman, M. L. Photoelectron spectra of 2,3-diazabicyclo[2.2. n]alk-2-enes ($n = 1,2,3,4$), *J. Am. Chem. Soc.* **95**, 6478 (1973).
- [3829] Eley, D. D., Hazeldine, D. J., and Palmer, T. F. Mass spectra, ionisation potentials and related properties of metal-free and transition metal phthalocyanines, *J. Chem. Soc. Faraday Trans. II* **69**, 1808 (1973).
- [3830] Evans, S., Green, J. C., and Jackson, S. E. He-(I) photoelectron spectra of some metal complexes containing the ligands trimethylsilylmethyl and neopentyl, *J. Chem. Soc. Faraday Trans. II* **69**, 191 (1973).
- [3831] Berkowitz, J., Dehmer, J. L., and Appelman, E. H. Photoelectron spectrum of hypofluorous acid, *HOF*, *Chem. Phys. Letters* **19**, 334 (1973).
- [3832] Batich, C., Heilbronner, E., Hornung, V., Ashe, A. J., Clark, D. T., Cobley, U. T., Kilcast, D., and Scanlan, I. Photoelectron spectra of phosphabenzene, arsabenzene, and stibabenzene, *J. Am. Chem. Soc.* **95**, 928 (1973).
- [3833] Cocksey, B. G., Eland, J. H. D., and Danby, C. J. Photoelectron spectra of the zinc and cadmium halides, *J. Chem. Soc. Faraday Trans. II* **69**, 1558 (1973).
- [3834] Dromey, R. G., Morrison, J. D., and Peel, J. B. Time-averaged and deconvoluted photoelectron spectrum of the first band of O_2 , *Chem. Phys. Letters*, **23**, 30 (1973).
- [3835] Bünzli, J. C., Frost, D. C., and McDowell, C. A. Photoelectron spectra of phosphoryl and thiophosphoryl chlorides and bromides, *J. Electron Spectrosc. Relat. Phenom.* **1**, 481 (1972/73).
- [3836] Foster, S., Felps, S., Cusachs, L. C., and McGlynn, S. P. Photoelectron spectra of osmium and ruthenium tetroxides, *J. Am. Chem. Soc.* **95**, 5521 (1973).
- [3837] Frost, D. C., Herring, F. G., Katrib, A., and McDowell, C. A. The photoelectron spectrum of ethylene sulphide, *Chem. Phys. Letters* **20**, 401 (1973).
- [3838] Diemann, E., and Müller, A. The He(I) photoelectron spectra of OsO_4 and RuO_4 , *Chem. Phys. Letters* **19**, 538 (1973).
- [3839] Delwiche, J., Natalis, P., Momigny, J., and Collin, J. E. On the photoelectron spectra of HBr and DBr , *J. Electron Spectrosc. Relat. Phenom.* **1**, 219 (1972/73).
- [3840] Frost, D. C., Lee, S. T., and McDowell, C. A. The photoelectron spectrum of HCP and comments on the first photoelectron band of HCN, *Chem. Phys. Letters* **23**, 472 (1973).
- [3841] Frost, D. C., Lee, S. T., and McDowell, C. A. The He I photoelectron spectrum of S_2O , *Chem. Phys. Letters* **22**, 243 (1973).
- [3842] Bünzli, J. C., Frost, D. C., and Weiler, L. Photoelectron spectrum of 7-thiabicyclo[2.2.1]heptane, *J. Am. Chem. Soc.* **95**, 7880 (1973).
- [3843] Bain, A. D., Bünzli, J. C., Frost, D. C., and Weiler, L. Photoelectron spectra of cyclic ethers, *J. Am. Chem. Soc.* **95**, 291 (1973).
- [3844] Bock, H., Mollère, P., Becker, G., and Fritz, G. Photoelectron spectra and molecular properties. XX. Dimethyl ether, methoxysilane, and disiloxane, *J. Organometal. Chem.* **61**, 113 (1973).
- [3845] Cooks, R. G., Bertrand, M., Beynon, J. H., Rennekamp, M. E., and Setser, D. W. Energy partitioning data as an ion structure probe. Substituted anisoles, *J. Am. Chem. Soc.* **95**, 1732 (1973).
- [3846] Boschi, R., and Schmidt, W. The photoelectron spectrum and structure of sulfur in the gas phase at 140°C , *Inorg. Nucl. Chem. Lett.* **9**, 643 (1973).
- [3847] Beez, M., Bieri, G., Bock, H., and Heilbronner, E. The ionization potentials of butadiene, hexatriene, and their methyl derivatives: evidence for through space interaction between double bond π -orbitals and non-bonded pseudo- π orbitals of methyl groups?, *Helv. Chim. Acta* **56**, 1028 (1973).
- [3848] Houk, K. N., Davis, L. P., Newkome, G. R., Duke, Jr., R. E., and Nauman, R. V. Photoelectron spectroscopy of cyclic β -diketones and their enolone tautomers, *J. Am. Chem. Soc.* **95**, 8364 (1973).
- [3849] Heilbronner, E., Gleiter, R., Hoshi, T., and Meijere, A. The interaction of Walsh-orbitals in diademane and related hydrocarbons, *Helv. Chim. Acta* **56**, 1594 (1973).
- [3850] Schweig, A., Weidner, U., and Manuel, G. Theory and application of photoelectron spectroscopy. XVI. Photoelectron spectroscopy and molecular conformations: Ge-C and Sn-C hyperconjugation and the conformation of allylgermanes and -stannanes, *J. Organometal. Chem.* **54**, 145 (1973).
- [3851] Miller, L. L., Koch, V. R., Koenig, T., Tuttle, M. Photoelectron spectroscopy and the anodic fragmentation of adamantane derivatives, *J. Am. Chem. Soc.* **95**, 5075 (1973).
- [3852] Johnstone, R. A. W., and Mellon, F. A. Photoelectron spectroscopy of sulphur-containing heteroaromatics and molecular orbital calculations, *J. Chem. Soc. Faraday*

- [3853] Haselbach, E., and Eberbach, W. The photolysis of tricyclo[4.2.1.0^{2,5}] nonadiene: support of a Dougherty 'Type N' mechanism from photoelectron spectroscopic studies, *Helv. Chim. Acta* **56**, 1944 (1973).
- [3854] Maier, J. P., and Turner, D. W. Steric inhibition of resonance studied by molecular photoelectron spectroscopy. Part 2. Phenylethylenes, *J. Chem. Soc. Faraday Trans. II* **69**, 196 (1973).
- [3855] Schmidt, W., Wilkins, B. T., Fritz, G., and Huber, R. Energy level trends in 1,3,5,7-tetrasiladamantanes ("carborundanes") and related molecules from photoelectron spectroscopy, *J. Organometal. Chem.* **59**, 109 (1973).
- [3856] Khalil, O. S., Meeks, J. L., and McGlynn, S. P. Electronic spectroscopy of highly polar aromatics. VII. Photoelectron spectra of nitroanilines, *J. Am. Chem. Soc.* **95**, 5876 (1973).
- [3857] Koch, E. E., Otto, A., and Radler, K. The absorption spectrum of the anthracene molecule in the vacuum ultraviolet, *Chem. Phys. Letters* **21**, 501 (1973).
- [3858] Schäfer, W., Schweig, A., Gronowitz, S., Taticchi, A., and Fringuelli, Reversal in the sequence of two highest occupied molecular orbitals in the series thiophen, selenophen, and tellurophen, *J. Chem. Soc. Chem. Commun.*, 541 (1973).
- [3859] Schmidt, H., Schweig, A., and Manuel, G. Preliminary communication. Theory and application of photoelectron spectroscopy. XXX. Hg-C hyperconjugation, *J. Organometal. Chem.* **55**, C1 (1973).
- [3860] Haselbach, E., Lanyiova, Z., and Rossi, M. On the correlation between ionization potentials and excitation energies, part III: pyrazine, *Helv. Chim. Acta* **56**, 2889 (1973).
- [3861] Schweig, A., and Thiel, W. Photoionization cross sections: He I and He II photoelectron spectra of saturated three-membered rings, *Chem. Phys. Letters* **21**, 541 (1973).
- [3862] Osafune, K., Katsumata, S., and Kimura, K. Photoelectron spectroscopic study of hydrazine, *Chem. Phys. Letters* **19**, 369 (1973).
- [3863] Mines, G. W., and Thompson, H. W. Photoelectron spectra of vinyl and allyl halides, *Spectrochim. Acta* **29A**, 1377 (1973).
- [3864] Katrib, A., and Rabalais, J. W. Electronic interaction between the vinyl group and its substituents, *J. Phys. Chem.* **77**, 2358 (1973).
- [3865] Lloyd, D. R., Roberts, P. J. The assignment of the photoelectron spectrum of sulphur dioxide, *Mol. Phys.* **26**, 225 (1973).
- [3866] Lichtenberger, D. L., Sarapu, A. C., and Fenske, R. F. Photoelectron spectra and electronic structure of pentacarbonylmanganese halides, *Inorg. Chem.* **12**, 702 (1973).
- [3867] Mollère, P., Bock, H., Becker, G., Fritz, G. Photoelectron spectra and molecular properties. XXI. Dimethyl sulfide, methyl silyl sulfide, and disilyl sulfide, *J. Organometal. Chem.* **61**, 127 (1973).
- [3868] McLean, R. A. N. The bonding of a silicon atom with a phenyl ring: the photoelectron spectrum of phenylsilane, *Can. J. Chem.* **51**, 2089 (1973).
- [3869] Jones, R. W., Koski, W. S. Photoelectron spectrum of pentaborane, *J. Chem. Phys.* **59**, 1228 (1973).
- [3870] Higginson, B. R., Lloyd, D. R., and Roberts, P. J. Variable temperature photoelectron spectroscopy. The adiabatic ionization potential of the iodine molecule, *Chem. Phys. Letters* **19**, 480 (1973).
- [3871] Fehlner, T. P., and Turner, D. W. Photoelectron spectrum of HBS, *J. Am. Chem. Soc.* **95**, 7175 (1973).
- [3872] Goodman, D. W., Dewar, M. J. R., Schweiger, J. R., and Cowley, A. H. The photoelectron spectrum of phosphorus pentafluoride, *Chem. Phys. Letters* **21**, 474 (1973).
- [3873] Streets, D. G., and Ceasar, G. P. Inductive and mesomeric effects on the π orbitals of halobenzenes, *Mol. Phys.* **26**, 1037 (1973).
- [3874] Watanabe, I., Yokoyama, Y., and Ikeda, S. Lone pair ionization potentials of carboxylic acids determined by He(I) photoelectron spectroscopy, *Bull. Chem. Soc. Japan* **46**, 1959 (1973).
- [3875] Sugar, J. Ionization energies of the neutral actinides, *J. Chem. Phys.* **59**, 788 (1973).
- [3876] Evans, K., Scheps, R., Rice, S. A., and Heller, D. Primary photochemical and photophysical processes in chloro- and bromo-acetylene, *J. Chem. Soc. Faraday Trans. II* **69**, 856 (1973).
- [3877] Aihara, J., and Inokuchi, H. Ionization potentials of anthracene, *Chem. Letters*, 421 (1973).
- [3878] Collins, R. J., Husain, D., and Donovan, R. J. Kinetic and spectroscopic studies of $O_2(a^1\Delta_g)$ by time-resolved absorption spectroscopy in the vacuum ultra-violet, *J. Chem. Soc. Faraday Trans. II* **69**, 145 (1973).
- [3879] Chadwick, D., Frost, D. C., Herring, F. G., Katrib, A., McDowell, C. A., and McLean, R. A. N. Photoelectron spectra of sulfur and thionyl halides, *Can. J. Chem.* **51**, 1893 (1973).
- [3880] Jonas, A. E., Schweitzer, G. K., Grimm, F. A., and Carlson, T. A. The photoelectron spectra of the tetrafluoro and tetramethyl compounds of the group IV elements, *J. Electron Spectrosc. Relat. Phenom.* **1**, 29 (1972/73).
- [3881] Chaghtai, M. S. Z., and Hassan, V. The ionization potential and the $4s4p^6nl$ levels of ^{86}Kr I, *J. Phys. B* **6**, 433 (1973).
- [3882] Basco, N., and Morse, R. D. Analysis of the Rydberg transitions in ethylene sulphide, *Chem. Phys. Letters* **20**, 404 (1973).
- [3883] Watanabe, I., Yokoyama, Y., and Ikeda, S. Vibrational structures in the photoelectron spectrum of formic acid, *Chem. Phys. Letters* **19**, 406 (1973).
- [3884] Zverev, V. V., Vovna, V. I., El'man, M. S., Kitaev, Yu. P., and Vilesov, F. I. Photoelectron spectra and structure of hydrazones, *Dokl. Akad. Nauk SSSR* **213**, 1319 (1973) [Engl. Transl.: *Dokl. Phys. Chem.* **213**, 945 (1973)].
- [3885] Gompper, R., Holsboer, F., Schmidt, W., and Seybold, G. Rapid double bond shift in a donor acceptor substituted cyclobutadiene. Evidence from 584-Å and X-ray photoelectron spectroscopy, *J. Am. Chem. Soc.* **95**, 8479 (1973).
- [3886] Worley, S. D., Mateescu, G. D., McFarland, C. W., Fort, R. C., Jr., and Sheley, C. F. Photoelectron spectra and MINDO-SCF-MO calculations for adamantane and some of its derivatives, *J. Am. Chem. Soc.* **95**, 7580 (1973).
- [3887] Nelsen, S. F., Buschek, J. M., and Hintz, P. J. Photoelectron spectra of hydrazines. II. Conformations of hexahydropyridazines, *J. Am. Chem. Soc.* **95**, 2013 (1973).
- [3888] Haselbach, E., Mannschreck, A., and Seitz, W. 'Lone pair' electronic structure, conformation and oxidation behaviour of diaziridines, *Helv. Chim. Acta* **56**, 1614 (1973).
- [3889] Nelsen, S. F., and Buschek, J. M. Photoelectron spectra of hydrazines. I. Dependence of the lone pair-lone pair splitting on dihedral angle for tetraalkylhydrazines, *J. Am. Chem. Soc.* **95**, 2011 (1973).
- [3890] Maier, J. P., and Turner, D. W. Steric inhibition of resonance studied by molecular photoelectron spectroscopy, *J. Chem. Soc. Faraday Trans. II* **69**, 521 (1973).
- [3891] Gronneberg, T., and Undheim, K. Mass spectrometry of onium compounds - XV. ionization potentials of amino pyridines, *Tetrahedron Letters*, 3193 (1973).
- [3892] Sustmann, R., and Schubert, R. Photoelektronenspektroskopische Bestimmung von Substituenten-Effekten. I. Substituierte butadiene,

- Tetrahedron Letters **27**, 2739 (1972).
- [3906] Appell, J., and Durup, J. The formation of protons by impact of low energy electrons on water molecules, *Intern. J. Mass Spectrom. Ion Phys.* **10**, 247 (1972/73).
- [3907] Mateescu, G. D., and Workey, S. D. Electron spectroscopy. II. Photoelectron spectra of adamantane and 1-bromoadamantane, *Tetrahedron Letters* **52**, 5285 (1972).
- [3908] Weidner, U., Schweig, A. Nature of the "silicon β -effect" in allyltrimethylsilane, *Angew. Chem. Intern. Ed.* **11**, 146 (1972).
- [3909] Hildenbrand, D. L. Thermochemistry of the molecular species LiO , LiO^+ , and Li_2O^+ , *J. Chem. Phys.* **57**, 4556 (1972).
- [3910] Klebe, K. J., Houde, J. J. v., and Thuijl, J. v. Loss of HCN and H from the molecular ion of imidazole, *Org. Mass Spectrom* **6**, 1363 (1972).
- [3911] Rabalais, J. W., Werme, L. O., Bergmark, T., Karlsson, L., and Siegbahn, K., The high resolution electron spectra of thiophene, 2-bromothiophene and 3-bromothiophene, *Intern. J. Mass Spectrom. Ion Phys.* **9**, 185 (1972).
- [3913] Berkowitz, J. Photoelectron spectroscopy of high-temperature vapors. I. TiCl , TiBr , and TiH , *J. Chem. Phys.* **56**, 2766 (1972).
- [3914] Doucet, J., Sauvageau, P., and Sandorfy, C. Vacuum ultraviolet and photoelectron spectra of fluoro-chloro derivatives of methane, *J. Chem. Phys.* **58**, 3708 (1973).
- [3915] Van Der Helm, D., Christian, S. D., and Lin, L.-N. Charge transfer complexes of purines and pyrimidines. 9-Cyclohexyladenine-iodine in organic solvents and in the solid state, *J. Am. Chem. Soc.* **95**, 2410 (1973).
- [3916] McLafferty, F. W., Bente, P. F., III., Kornfeld, R., Tsai, S.-C., and Howe, I. Collisional activation spectra of organic ions, *J. Am. Chem. Soc.* **95**, 2120 (1973).
- [3918] Fedorova, M. S., Denisov, Yu. V., and Potapov, V. K. Mass-spectrometric study of the photoionisation processes of tricyclo[5.2.1.0^{2,6}] decane and its alkyl derivatives, *Zh. Fiz. Khim.* **47**, 2667 (1973) [Engl. transl.: *Russ. J. Phys. Chem.* **47**, 1498 (1973)].
- [3919] Stockbauer, R. Threshold electron-photoion coincidence mass spectrometric study of CH_4 , CD_4 , C_2H_6 , and C_2D_6 , *J. Chem. Phys.* **58**, 3800 (1973).
- [3920] Berkowitz, J., Dehmer, P. M., and Chupka, W. A. Photoionization mass spectrometry of F_2O , *J. Chem. Phys.* **59**, 925 (1973).
- [3921] Dibeler, V. H., and Walker, J. A. Photoionization of acetylene near threshold, *Intern. J. Mass Spectrom. Ion Phys.* **11**, 49 (1973).
- [3922] Pitt, C. G. Hyperconjugation and its role in group IV chemistry, *J. Organometal. Chem.* **61**, 49 (1973).
- [3923] Minnhagen, L. Spectrum and the energy levels of neutral argon, *Ar I*, *J. Opt. Soc. Am.* **63**, 1185 (1973).
- [3924] Reader, J., and Epstein, G. Zeeman effect and revised analysis of singly ionized rubidium (Rb II), *J. Opt. Soc. Am.* **63**, 1153 (1973).
- [3925] McCulloh, K. E. Photoionization of carbon dioxide, *J. Chem. Phys.* **59**, 4250 (1973).
- [3927] Killgoar, P. C., Jr., Leroi, G. E., Chupka, W. A., and Berkowitz, J. Photoionization study of NO_2 . I. The ionization potential, *J. Chem. Phys.* **59**, 1370 (1973).
- [3928] Berkowitz, J., and Wahl, A. C. The dissociation energy of fluorine, *Advan. Fluorine Chem.* **7**, 147 (1973).
- [3929] Okabe, H., and Dibeler, V. H. Photon impact studies of C_2HCN and CH_3CN in the vacuum ultraviolet; heats of formation of C_2H and CH_3CN , *J. Chem. Phys.* **59**, 2430 (1973).
- [3930] Reinke, D., Kraessig, R., and Baumgärtel, H. Photoreactions of small organic molecules, *Z. Naturforsch.* **28a**, 1021 (1973).
- [3931] Dibeler, V. H., Walker, J. A., and McCulloh, K. E. Observations on hot bands in the molecular and dissociative photoionization of acetylene and the heat of formation of the ethynyl ion, *J. Chem. Phys.* **59**, 2264 (1973).
- [3932] Berkowitz, J., Appelman, E. H., and Chupka, W. A. Photoionization of HOF with mass analysis, *J. Chem. Phys.* **58**, 1950 (1973).
- [3933] Hoffmann, R. W., Schüttler, R., Schäfer, W., and Schweig, A. Methylen-norbornadien, ein Bicycloheptafulven, *Angew. Chem.* **84**, 533 (1972).
- [3934] Oehling, H., Schäfer, W., and Schweig, A. Sequence of highest occupied molecular orbitals in the phosphorin system, *Angew. Chem. Intern. Ed.* **10**, 656 (1971).
- [3935] Lloyd, D. R. Calibration of a He(I) photoelectron spectrometer, *J. Phys. E* **3**, 629 (1972).
- [3936] Cowan, D. O., Gleiter, R., Hashmall, J. A., Heilbronner, E., and Hornung, V. Interaction between the orbitals of lone pair electrons in dicarbonyl compounds, *Angew. Chem. Intern. Ed.* **10**, 401 (1971).
- [3937] Sustmann, R., and Trill, H. Photoelektronenspektroskopische Bestimmung von Substituenten-Effekten. II. α,β -ungesättigte Carbonester, *Tetrahedron Letters* **42**, 4271 (1972).
- [3938] Rabalais, J. W., and Colton, R. J. Electronic interaction between the phenyl group and its unsaturated substituents, *J. Electron Spectrosc. Relat. Phenom.* **1**, 83 (1972/73).
- [3939] Tamás, J., Czira, G., Maltsev, A. K., and Nefedov, O. M. Electron impact studies on some organochlorogermanes: mass spectra and bond dissociation energies, *J. Organometal. Chem.* **40**, 311 (1972).
- [3940] Weidner, U., and Schweig, A. Theory and application of photoelectron spectroscopy. V. The nature of bonding in vinyl- and allylsilanes: the effects of $\sigma-\pi$ (hyperconjugation) and $p_\pi-d_\pi$ conjugation in these compounds, *J. Organometal. Chem.* **39**, 261 (1972).
- [3941] Robin, M. B., and Kuebler, N. A. Excited electronic states of the simple alcohols, *J. Electron Spectrosc. Relat. Phenom.* **1**, 13 (1972/73).
- [3942] Golob, L., Jonathan, N., Morris, A., Okuda, M., and Ross, K. J. The first ionization potential of the methyl radical as determined by photoelectron spectroscopy, *J. Electron Spectrosc. Relat. Phenom.* **1**, 506 (1972/73).
- [3943] Brundle, C. R., and Jones, G. R. The high resolution photoelectron spectra and the electronic structure of XeOF_4 , *J. Electron Spectrosc. Relat. Phenom.* **1**, 403 (1972/73).
- [3945] Dông, P., and Bizot, M. Dissociation uni- et bi-moléculaire des ions NO^+ , *Intern. J. Mass Spectrom. Ion Phys.* **10**, 227 (1972/73).
- [3946] Pitt, C. G., and Bock, H. $\sigma-\pi$ Mixing in phenylpentamethyldisilane, *J. Chem. Soc. Chem. Commun.*, 28 (1972).
- [3947] Piacente, V., and Malaspina, L. Dissociation energy of the TiAs molecule, *J. Chem. Phys.* **56**, 1780 (1972).
- [3948] Boekelheide, V., Murrell, J. N., and Schmidt, W., The photoelectron spectrum of *trans*-15,16-dimethyl-dihydropyrene, *Tetrahedron Letters* **7**, 575 (1972).
- [3949] De Maria, G., Malaspina, L., and Piacente, V. Dissociation energy of the gaseous TiBi molecule, *J. Chem. Phys.* **56**, 1978 (1972).
- [3950] Mollère, P., Bock, H., Becker, G., and Fritz, G. Photoelectron spectra and molecular properties. XV. The effects of α - and β -silyl substituents on π -systems, *J. Organometal. Chem.* **46**, 89 (1972).
- [3951] Boschi, R., and Schmidt, W. Photoelectron spectra of polycyclic aromatic hydrocarbons. Pyrene and coronene, *Tetrahedron Letters* **25**, 2577 (1972).
- [3952] Saalfeld, F. E., DeCorpo, J. J., and McDowell, M. V. The mass spectra of some metal carbonyl complexes of tris(dimethylamino)phosphine, *J. Organometal. Chem.* **44**,

- [3953] Boschi, R., Schmidt, W., and Gfeller, J.-C. The electronic structure of 1,6-methano-cyclodecapentaene, *Tetrahedron Letters*, 4107 (1972).
- [3954] Schaaf, D. W., and Gregory, N. W. Mass spectrometric study of the vaporization of cuprous bromide, *J. Phys. Chem.* **76**, 3271 (1972).
- [3955] Debies, T. P., and Rabalais, J. W. Photoelectron spectra of substituted benzenes. II. Seven valence electron substituents, *J. Electron Spectrosc. Relat. Phenom.* **1**, 355 (1972/73).
- [3956] Cabaud, B., Hoareau, A., Nounou, P., and Uzan, R. High temperature mass spectrometric study of polyatomic antimony species by electron impact. Direct evidence for the existence of Sb_4 molecules, *Intern. J. Mass Spectrom. Ion Phys.* **11**, 157 (1973).
- [3957] Masclet, P., Grosjean, D., and Mouvier, G. Alkene ionization potentials. Part I. Quantitative determination of alkyl group structural effects, *J. Electron Spectrosc. Relat. Phenom.* **2**, 225 (1973).
- [3958] Berkowitz, J., Dehmer, J. L., and Walker, T. E. H. PES of hightemperature vapors. IV. The cesium halides. Effect of spin-orbit interaction on the photoelectron and mass spectra of the alkali halides, *J. Chem. Phys.* **59**, 3645 (1973).
- [3959] Van Den Ham, D. M. W., and Van Der Meer, D. Photoelectron spectra of some fluorine substituted diazanaphthalenes, *J. Electron Spectrosc. Relat. Phenom.* **2**, 247 (1973).
- [3960] Berkowitz, J., Dehmer, J. L., Shimada, K., and Szwarc, M. Photoelectron spectroscopic studies of $(\alpha\text{-naphthyl})\text{-(CH}_3)_2\text{-(}\alpha\text{-naphthyl)}$ vapor: open chain or cyclic conformation?, *J. Elec. Spectrosc. Relat. Phenom.* **2**, 211 (1973).
- [3961] Kordis, J., and Gingerich, K. A. Mass spectroscopic investigation of the equilibrium dissociation of gaseous Sb_2 , Sb_3 , Sb_4 , SbP , SbP_2 , and P_2 , *J. Chem. Phys.* **58**, 5141 (1973).
- [3962] Ackermann, R. J., and Rauh, E. G. High temperature properties of the thorium-oxygen system: a revision of the thermodynamic properties of $ThO(g)$ and $ThO_2(g)$, *High Temp. Sci.* **5**, 463 (1973).
- [3963] Boggess, G. W., Allen, J. D., Jr., and Schweitzer, G. K. The photoelectron spectra of gaseous zinc(II) and cadmium(II) chlorides, bromides, and iodides, *J. Electron Spectrosc. Relat. Phenom.* **2**, 467 (1973).
- [3964] Kobayashi, T., Yokota, K., and Nagakura, S. Photoelectron spectra of styrenes, *J. Electron Spectrosc. Relat. Phenom.* **3**, 449 (1973).
- [3965] Frost, D. C., Lee, S. T., and McDowell, C. A. Photoelectron spectra of $OCSe$, $SCSe$, and CSe_2 , *J. Chem. Phys.* **59**, 5484 (1973).
- [3966] Gingerich, K. A., Cocke, D. L., Finkheiner, H. C., and Chang, C.-A. High temperature Knudsen cell mass spectrometric determination of the heats of atomization of $AlAu_2$ and Al_2Au , *Chem. Phys. Letters* **18**, 102 (1973).
- [3967] Morrison, J. D., and Traeger, J. C. Ionization and dissociation by electron impact. I. H_2O and H_2S , *Intern. J. Mass Spectrom. Ion Phys.* **11**, 77 (1973).
- [3968] Gingerich, K. A. Mass spectrometric evidence for the very high stability of gaseous $ThIr$ and $ThPt$ and method of calculating dissociation energies of diatomic intermetallic compounds with multiple bonds, *Chem. Phys. Letters* **23**, 270 (1973).
- [3969] Guido, M., Gigli, G. Mass spectrometric study of the $CeSiC$ molecules, *J. Chem. Phys.* **59**, 3437 (1973).
- [3970] Scott, J. D., Causley, G. C., and Russell, B. R. Vacuum ultraviolet absorption spectra of dimethylsulfide, dimethylselenide, and dimethyltelluride, *J. Chem. Phys.* **59**, 6577 (1973).
- [3971] Dehmer, J. L., Berkowitz, J., and Cusachs, L. C. Photoelectron spectroscopy of high-temperature vapors. III. Monomer and dimer spectra of thallous fluoride, *J. Chem. Phys.* **58**, 5681 (1973).
- [3973] Benoit, F. Substituent effects in mass spectrometry. III. Substituent effects in the dissociation of the molecular ions of *para* and *meta* substituted benzoic acids, *Org. Mass Spectrom.* **7**, 295 (1973).
- [3974] Kaufman, V., and Sugar, J. One-electron spectrum of singly ionized ytterbium ($Yb II$), *J. Opt. Soc. Am.* **63**, 1168 (1973).
- [3975] Gardner, J. L., and Samson, J. A. R. 304. Å photoelectron spectra of CO , N_2 , O_2 and CO_2 , *J. Electron Spectrosc. Relat. Phenom.* **2**, 259 (1973).
- [3976] Work, D. E., and Eick, H. A. An investigation of the incongruent sublimation of some lanthanide (III) oxobromides, *High Temp. Sci.* **5**, 313 (1973).
- [3977] Fjeldstad, P. E., and Undheim, K. Mass spectrometry of onium compounds. XXX. Ionisation potential in structural assignment of some gaseous molecules, *Org. Mass Spectrom.* **7**, 639 (1973).
- [3978] Cocke, D. L., Gingerich, K. A., and Kordis, J. Determination of the high bond dissociation energy of the molecule $LaRh$, *High Temp. Sci.* **5**, 474 (1973).
- [3979] Higginson, B. R., Lloyd, D. R., Burroughs, P., Gibson, D. M., and Orchard, A. F. Photoelectron studies of metal carbonyls. Part 2. The valence region photoelectron spectra of the Group VIA hexacarbonyls, *J. Chem. Soc. Faraday Trans. II* 1659 (1973).
- [3980] Mollere, P. D. The photoelectron spectrum of oxetane: non-degenerate Walsh orbitals in a four-membered heterocycle, *Tetrahedron Letters*, 2791 (1973).
- [3981] Gleiter, R., Schmidt, E., Cowan, D. O., and Ferraris, J. P. The electronic structure of tetrathiofulvalene, *J. Electron Spectrosc. Relat. Phenom.* **2**, 207 (1973).
- [3982] Kroto, H. W., Suffolk, R. J., and Westwood, N. P. C. The photoelectron spectrum of thioborane, *HBS*, *Chem. Phys. Letters* **22**, 495 (1973).
- [3983] Katayama, D. H., Huffman, R. E., and O'Bryan, C. L. Absorption and photoionization cross sections for H_2O and D_2O in the vacuum ultraviolet, *J. Chem. Phys.* **59**, 4309 (1973).
- [3984] Yamazaki, T., Katsumata, S., and Kimura, K. Photoelectron spectra and orbital assignments by sum rule consideration: ethyl and *n*-propyl fluorides, *J. Electron Spectrosc. Relat. Phenom.* **2**, 335 (1973).
- [3985] Thompson, K. R. Mass spectrometric determination of the atomization energies of $AlSiO(g)$ and $Al_2O(g)$, *High Temp. Sci.* **5**, 62 (1973).
- [3986] Piacente, V., Bardi, G., Malaspina, L., and Desideri, A. Dissociation energy of CeO_2 and Ce_2O_2 molecules, *J. Chem. Phys.* **59**, 31 (1973).
- [3987] Leavell, S., Steichen, J., and Franklin, J. L. Photoelectron spectra of intramolecularly hydrogen bonded compounds, *J. Chem. Phys.* **59**, 4343 (1973).
- [3988] Cowling, S. A., and Johnstone, R. A. W. Photoelectron spectroscopy: the effects of steric inhibition to resonance in anilines, *J. Electron Spectrosc. Relat. Phenom.* **2**, 161 (1973).
- [3989] Santoro, E. The fragmentation of some alkyl thiophosphate esters by electron-impact, *Org. Mass Spectrom.* **7**, 589 (1973).
- [3990] Boschi, R., Schmidt, W., Suffolk, R. J., Wilkins, B. T., Lempka, H. J., and Ridyard, J. N. A. Complete valence shell electronic structure of adamantane from He I and He II photoelectron spectroscopy, *J. Electron Spectrosc. Relat. Phenom.* **2**, 377 (1973).
- [3991] Goldstein, M. J., Natowsky, S., Heilbronner, E., and Hornung, V. Near cancellation of through space and through bond interaction in bicyclo[3.2.2]nona-6,8-diene, *Helv. Chim.*

- Acta **56**, 294 (1973).
- [3992] Schmidt, H., and Schweig, A. C-Hal Hyperkonjugation, *Tetrahedron Letters*, 981 (1973).
- [3993] Müller, C., and Schweig, A. Konjugation in Sulfonen, *Tetrahedron* **29**, 3973 (1973).
- [3994] Schweig, A., Weidner, U., Berger, J. G., and Grahn, W. Spirokonjugation, *Tetrahedron Letters*, 557 (1973).
- [3995] Schmidt, H., and Schweig, A. Ausschluss transanularer Wechselwirkung in 2,5-Dihydrothiophen, *Tetrahedron Letters*, 1437 (1973).
- [3996] Mathar, W., Bohlmann, F., and Schwarz, H. Massenspektrometrische Untersuchung von Amidin. V. Über den Einfluss der N-Donatorstärke auf die Aktivierungs-Energie der Methyl-Abspaltung aus Crotonsäureamidin, *Tetrahedron Letters*, 4583 (1973).
- [3997] Bruckmann, P., and Klessinger, M. Photoelektronenspektren organischer Verbindungen. III. Photoelektronenspektren acetylen-substituierter kleiner Ringe, *J. Electron Spectrosc. Relat. Phenom.* **2**, 341 (1973).
- [3998] Eland, J. H. D. Predissociation of N_2O^+ and COS^+ ions studied by photoelectronphotoion coincidence spectroscopy, *Intern. J. Mass Spectrom. Ion Phys.* **12**, 389 (1973).
- [3999] Batich, C., Bischof, P., and Heilbronner, E. The photoelectron spectra of cyclooctatetraene and its hydrogenated derivatives, *J. Electron Spectrosc. Relat. Phenom.* **1**, 333 (1972/73).
- [4000] Schmidt, W. Photoelectron spectra of diamondoid molecules, adamantane, silamantane and urotropine, *Tetrahedron* **29**, 2129 (1973).
- [4001] Drowart, J., Myers, C. E., Szwarc, R., Vander Auwera-Mahieu, A., and Uy, O. M. The dissociation energies of the molecules PS, PSe, and PTe, *High Temp. Sci.* **5**, 482 (1973).
- [4002] Bieri, G., Brogli, F., Heilbronner, E., and Kloster-Jensen, E. A photoelectron spectroscopic investigation of the electronic structure of trimethylsilylhaloacetylenes, *J. Electron Spectrosc. Relat. Phenom.* **1**, 67 (1972/73).
- [4003] Botter, R., Menes, F., Gounelle, Y., Pechine, J. M., and Solgadi, D. The ionization potentials of geometrical isomers: the *cis* and *trans* 2-substituted cyclopentyl and cyclohexyl bromides, *Intern. J. Mass Spectrom. Ion Phys.* **12**, 188 (1973).
- [4004] Bünzli, J. C., Frost, D. C., Weiler, L. The photoelectron spectrum of triquinacene, *Tetrahedron Letters*, 1159 (1973).
- [4005] Stearns, C. A., and Kohl, F. J. Mass spectrometric determination of the dissociation energies of gaseous Al_2 , $AlSi$, and $AlSiO$, *High Temp. Sci.* **5**, 113 (1973).
- [4006] Gleiter, R., Heilbronner, E., Paquette, L. A., Thompson, G. L., and Wingard, R. E., Jr. Photoelectron spectra of polyunsaturated [4,4,2]propellanes, *Tetrahedron* **29**, 565 (1973).
- [4008] Ceasar, G. P., Green, J., Paquette, L. A., and Wingard, R. E., Jr. Orbital interaction in 2a,8b-dihydrocyclopent[cd]azulene, *Tetrahedron Letters*, 1721 (1973).
- [4009] Cradock, S., Findlay, R. H., and Palmer, M. H. The molecular energy levels of the azoles: a study by photoelectron spectroscopy and ab initio molecular orbital calculations, *Tetrahedron* **29**, 2173 (1973).
- [4010] Bünzli, J. C., Burak, A. J., and Frost, D. C. Through-space interaction in non-conjugated acyclic dienes studied by photoelectron spectroscopy, *Tetrahedron* **29**, 3735 (1973).
- [4011] Tondello, G. Absorption spectrum of Cu I in the vacuum ultraviolet, *J. Opt. Soc. Am.* **63**, 346 (1973).
- [4012] Kordis, J., and Gingerich, K. A. Dissociation energies and heats of formation of the gaseous Eu_2 and $EuAg$ molecules, *J. Phys. Chem.* **77**, 700 (1973).
- [4013] Rabeneck, H., Rinke, K., and Schäfer, H. ReO_3 , Jg Bildung, Massenspektrum, Ionisierungsenergie und Bildungsenthalpie, *Z. Anorg. Allg. Chem.* **397**, 112 (1973).
- [4014] Stearns, C. A., and Kohl, F. J. Mass spectrometric determination of the dissociation energies of $AlCl_2$, Al_2C_2 , and $AlAuC_2$, *J. Phys. Chem.* **77**, 136 (1973).
- [4015] Müller, J., and Goll, W. Ion-Molekül-Reaktionen von (Cyclopentadienyl)-nitrosynickel mit σ - und π -Donatoren in der Gasphase, *Chem. Ber.* **106**, 1129 (1973).
- [4016] Skinner, H. B., and Searcy, A. W. Mass spectrometric studies of gaseous oxides of rhenium, *J. Phys. Chem.* **77**, 1573 (1973).
- [4017] Clark, P. A., Gleiter, R., and Heilbronner, E. Photoelectron spectra of planar sulfur heterocycles, *Tetrahedron* **29**, 3085 (1973).
- [4018] Fortin, C. J., and Rousseau, Y. Spectrométrie de masse des cyclohexanones *gem*-diphénylées. II. Chaleurs de formation et structures possibles des principaux ions fragmentaires, *Can. J. Chem.* **51**, 3457 (1973).
- [4019] Brogli, F., Crandall, J. K., Heilbronner, E., Kloster-Jensen, E., and Sojka, S. A. The photoelectron spectra of methyl-substituted allenes and of tetramethyl-bisallenyl, *J. Electron Spectrosc. Relat. Phenom.* **2**, 455 (1973).
- [4020] Tanaka, K., and Tanaka, I. Photoelectron spectra from some autoionizing states of O_2 near the ionization threshold, *J. Chem. Phys.* **59**, 5042 (1973).
- [4021] Nixon, J. F. Photoelectron spectra and bonding in metal-trifluorophosphine complexes, *J. Chem. Soc. Dalton Trans.* **21**, 2226 (1973).
- [4022] Katrib, A., Debies, T. P., Colton, R. J., Lee, T. H., and Rabalais, J. W. The use of differential photoionization cross sections as a function of excitation energy in assigning photoelectron spectra, *Chem. Phys. Letters* **22**, 196 (1973).
- [4023] Berkosky, J. L., Ellison, F. O., Lee, T. H., and Rabalais, J. W. Model for calculating spin-orbit interactions with applications to photoelectron spectroscopy, *J. Chem. Phys.* **59**, 5342 (1973).
- [4024] Kroner, J., Strack, W., Holsboer, F., and Kosbahn, W. Zur Elektronenstruktur der Thiokumulene, *Z. Naturforsch.* **28b**, 188 (1973).
- [4025] Akopyan, M. E., Sergeev, Yu. L., and Vilesov, F. I. Photoionization in vapors of aliphatic sulfides. I. Methylmercaptan, dimethyl and diethyl sulfides, *Khim. Vys. Energ.* **4**, 305 (1970) [Engl. transl.: *High Energy Chem.* **4**, 265 (1970)].
- [4026] Cradock, S., Ebsworth, E. A. V., and Whiteford, R. A. Photoelectron spectra of some simple fluorosilanes, *J. Chem. Soc. Dalton Trans.* **22**, 2401 (1973).
- [4027] Venkateswarlu, P. The vacuum ultraviolet spectrum of ICl, *Can. J. Phys.* **53**, 812 (1975).
- [4028] Potapov, V. K., and Isakov, L. I. Electronic structure and photoionization of aromatic amines, *Khim. Vys. Energ.* **5**, 264 (1971) [Engl. transl.: *High Energy Chem.* **5**, 237 (1971)].
- [4029] Kobayashi, H., Kobayashi, M., and Kaizu, Y. Molecular complexes of arenetricarbonylchromium, *Bull. Chem. Soc. Japan* **46**, 3109 (1973).
- [4030] Antonova, N. L., Kusev, V. S. Mass-spectrometric investigation of the thermal dissociation of neodymium dicarbide, *Zh. Fiz. Khim.* **47**, 2446 (1973) [Engl. transl.: *Russ. J. Phys. Chem.* **47**, 1385 (1973)].
- [4031] Isakov, L. I., Potapov, V. K. Photoionization and decomposition of benzaldehyde, acetophenone, and benzophenone, *Khim. Vys. Energ.* **5**, 265 (1971) [Engl. transl.: *High Energy Chem.* **5**, 238 (1971)].
- [4032] Ogata, H., Onizuka, H., Nihei, Y., Kamada, H. The photoelectron spectra of alcohols, mercaptans and amines, *Bull. Chem. Soc. Japan* **46**, 3036 (1973).

- [4033] Hoshino, H., Tajima, S., and Tsuchiya, T. The effect of the temperature on the mass spectra of aliphatic primary alcohols and 1-alkenes. I. *Bull. Chem. Soc. Japan* **46**, 3043 (1973).
- [4034] Askani, R., Gleiter, R., Heilbronner, E., Hornung, V., and Musso, H. The orbital sequence in semibullvalene, barbaralene and dihydrobullvalene, *Tetrahedron Letters*, 4461 (1971).
- [4035] Pozharskii, A. F., Kashparov, I. S., Holls, P. J., and Zaletov, V. G. Heterocyclic pleiadene analogs. VI. Electronic properties of perimidine, *Khim. Geterotsikl. Soedin.* **4**, 543 (1971) [Engl. transl.: *Chem. Heterocycl. Compd.* **4**, 507 (1971)].
- [4036] Shen, K.-W., and Kuebler, N. A. Synthesis, reactions, and photoelectron spectrum of 8,11-dimethylenepentacyclo [5.4.0.0^{2,6}.0^{3,10}.0^{5,9}] tridecane, *Tetrahedron Letters*, 2145 (1973).
- [4037] Bischof, P., Haselbach, E., and Heilbronner, E. Photoelectron spectrum of cyclobutane, *Angew. Chem. Intern. Ed.* **9**, 953 (1970).
- [4038] Heilbronner, E., and Muszkat, K. A. On the relative importance of through-space vs. through-bond interaction between the lone pairs in 1,4-diazabicyclo[2.2.2]octane, *J. Am. Chem. Soc.* **92**, 3818 (1970).
- [4039] Brogli, F., and Heilbronner, E. The photoelectron spectra of benzenoid hydrocarbons C₁₀H₁₂, *Angew. Chem. Intern. Ed.* **11**, 538 (1972).
- [4040] Brogli, F., Eberbach, W., Haselbach, E., Heilbronner, E., Hornung, V., and Lemal, D. M. 199. Die Photoelektronen-Spektren des Tricyclo[4.2.1.0^{2,5}]nonadiens und seines 3,4-Diaza-Analogons. Ein Beitrag zur Kenntnis der Wechselwirkung zwischen den einsamen Elektronenpaaren der cis-konfigurierten Azogruppe, *Helv. Chim. Acta* **56**, 1933 (1973).
- [4041] Schwarz, H., Bohlmann, F., and Russ, B. Elektronenstossinduzierte Fragmentierung von Polymethylbenzaldehyden. II. Mechanismus der Methyl-Abspaltung aus dem Molekül-Ion von tri- und Pentamethylbenzaldehyden, *Org. Mass Spectrom.* **7**, 1001 (1973).
- [4043] Zverev, V. V., Vovna, V. I., Él'man, M. S., Kitaev, Yu. P., and Vilesov, F. I. Photoelectronic spectra and electronic and three-dimensional structures of acyclic azines, *Dokl. Akad. Nauk. SSSR* **213**, 1117 (1973) [Engl. transl.: *Dokl. Phys. Chem.* **213**, 1100 (1973)].
- [4044] Schwarz, H., and Bohlmann, F. Elektronenstossinduzierte Fragmentierung von Acetylenverbindungen. VI. Struktur und Bildungsenthalpie der Ionen [C₁₁H₉]⁺ und [C₉H₇]⁺, *Org. Mass Spectrom.* **7**, 395 (1973).
- [4045] Gleiter, R., Heilbronner, E., Hekman, M., and Martin, H.-D. π -Orbital-Wechselwirkungen "through space" and "through bond" in tricyclo[4.2.0.0^{2,5}]octadienen, *Chem. Ber.* **106**, 28 (1973).
- [4046] Schwarz, H., and Bohlmann, F. Massenspektrometrische Untersuchung von Amidin. I. Energetische Betrachtungen zur elektronenstossinduzierten Fragmentierung von Piperidin- und Piperidein- Amidin, *Org. Mass Spectrom.* **7**, 1197 (1973).
- [4047] Heilbronner, E., and Martin, H.-D. Über die Orbitalsequenz in aliphatischen Diazoverbindungen, *Chem. Ber.* **106**, 3376 (1973).
- [4048] Brogli, F., Heilbronner, E., Hornung, V., and Kloster-Jensen, E. 230. Die Photoelektronen-Spektren methyl-substituierter Acetylene, *Helv. Chim. Acta* **56**, 2171 (1973).
- [4049] Batich, C., Heilbronner, E., and Semmelhack, M. F. 225. Bemerkung zur Gleichheit der Aufspaltungen ΔI (zwischen den ersten beiden π -Ionisationspotentialen) und ΔE (zwischen den entsprechenden $\pi^* \leftarrow \Pi$ Übergangsenergien) des Spiro[4.4] nonatetraens, *Helv. Chim. Acta* **56**, 2110 (1973).
- [4050] Schmidt, W., and Wilkins, B. T. Das "Equivalent Orbital" (EO)-Verfahren zur Interpretation von Photoelektronen(PE)-Spektren: Neopentan, *Angew. Chem.* **84**, 168 (1972).
- [4051] Schwarz, H., Bohlmann, F., and Vorlaender, W. Elektronenstossinduzierte Fragmentierung von Polymethylbenzaldehyden. III. Bildung und Zerfall des Formyltropylium-Ions aus Dimethylbenzaldehyd, *Org. Mass Spectrom.* **7**, 1005 (1973).
- [4052] Paulus, J.-M., and Abbé, J.-C. Potentiel d'apparition de I₂²⁺ a partir de I₂, *J. Chim. Phys.* **70**, 690 (1973).
- [4053] Schweig, A., Schäfer, W., and Dimroth, K. Unusual sequence of the two highest occupied π -molecular orbitals in the phosphorin system, *Angew. Chem. Intern. Ed.* **11**, 631 (1972).
- [4054] Uy, O. M., Srivastava, R. D., and Farber, M. Mass spectrometric determination of the heats of formation of gaseous BO₂ and BOF₂, *High Temp. Sci.* **3**, 462 (1971).
- [4055] Rodionov, A. N., Potapov, V. K., and Rogozhin, K. L. Photoionization of certain aromatic heteroorganic compounds, *Khim. Vys. Energ.* **7**, 278 (1973) [Engl. transl.: *High Energy Chem.* **7**, 249 (1973)].
- [4056] Ikuta, S., Yoshihara, K., Shiokawa, T., Jinno, M., Yokoyama, Y., and Ikeda, S. Photoelectron spectroscopy of cyclohexane, cyclopentane, and some related compounds, *Chem. Letters*, 1237 (1973).
- [4057] Isakov, L. I., and Potapov, V. K. Photoionization and decomposition of benzaldehyde, acetophenone, and benzophenone, *Khim. Vys. Energ.* **5**, 265 (1971) [Engl. transl.: *High Energy Chem.* **5**, 238 (1971)].
- [4058] Potapov, V. K., and Bazhenov, B. A. The photoionization of pyrrole, furan, and thiophene, *Khim. Vys. Energ.* **4**, 553 (1970) [Engl. transl.: *High Energy Chem.* **4**, 505 (1970)].
- [4060] Camus, P., and Tomkins, F. S. Absorption-line series in Lu I, *J. Phys. (Paris)* **33**, 197 (1972).
- [4061] Ackermann, R. J., and Rauh, E. G. A high-temperature study of the stoichiometry, phase behavior, vaporization characteristics, and thermodynamic properties of the cerium + oxygen system, *J. Chem. Thermodyn.* **3**, 609 (1971).
- [4062] Schwarz, H., Praefcke, K., and Martens, J. Organische Schwefelverbindungen. III. Elektronenstossinduzierte Untersuchungen von Arylestern der Monothiound Dithiophthalsäure und der isomeren 3,3-substituierten Phthalide, *Tetrahedron* **29**, 2877 (1973).
- [4063] Brogli, F., Giovannini, E., Heilbronner, E., and Schurter, R. Die Photoelektronenspektren der Benzocycloalkene, *Chem. Ber.* **106**, 961 (1973).
- [4065] Kroner, J., Nölle, D., and Nöth, H. Photoelektronenspektroskopische Untersuchungen an Bor-Verbindungen. I. Orbitalreihenfolgen und Ladungsdichten in Methylthiound Methoxyborane, *Z. Naturforsch. Teil. B.* **28**, 416 (1973).
- [4066] Schäfer, W., Schweig, A., Märkl, G., and Heier, K.-H. Zur Elektronenstruktur der λ_2 - und λ_3 -Phosphanaphthalene- ungewöhnlich grosse MO Destabilisierungen, *Tetrahedron Letters* 3743 (1973).
- [4067] Stafast, H., Bock, H. Photoelectron spectra and molecular properties. XVII. Hyperconjugation in dicyano methane and 2,2-dicyano propane, *Z. Naturforsch.* **28b**, 746 (1973).
- [4068] Katsumata, S., Iwai, T., and Kimura, K. Photoelectron spectra and sum rule consideration. Higher alkyl amines and alcohols, *Bull. Chem. Soc. Japan* **46**, 3391 (1973).
- [4069] Parr, G. R., and Taylor, J. W. A photoionization mass spectrometer utilizing a high intensity molecular beam sampling system and synchrotron radiation, *Rev. Sci.*

- Instrum. **44**, 1578 (1973).
- [4070] Syrvatka, B. G., Gil'burd, M. M., Bel'ferman, A. L. Mass spectrometric study of chlorofluoro-substituted ethylenes, *Zh. Org. Khim.* **8**, 1553 (1972) [Engl. transl.: *J. Org. Chem. USSR* **8**, 1587 (1972)].
- [4071] Ivko, A. A. Use of mass spectroscopy and isotope labelling for determining the structure of ions and molecules, *Org. Katal.*, 20 (1970).
- [4072] Puttemans, J.-P., and Hanson, A. Etude énergétique du ferrocène et du cobaltocène par impact électronique. Enthalpie de formation du radical cyclopentadiényle, *Ing. Chim. (Brussels)* **53**, 17 (1971).
- [4073] Natalis, P. Contribution à la spectroscopie photoélectronique. Effets de l'autoionisation dans les spectres photoélectroniques de molécules diatomiques et triatomiques, *Acad. R. Belg. Mem. Cl. Sci. Collect. 8^{me}-2^e Ser. T 41(1)*, (1973).
- [4074] Fortin, C. J., Forest, M., Vaziri, C., Gravel, D., and Rousseau, Y. Spectrométrie de masse des cyclohexanones *gem*-diphénylées. I. Localisation de la charge positive, *Can. J. Chem.* **51**, 3445 (1973).
- [4075] Rosenstock, H. M., Larkins, J. T., and Walker, J. A. Interpretation of photoionization thresholds: quasiequilibrium theory and the fragmentation of benzene, *Intern. J. Mass Spectrom. Ion Phys.* **11**, 309 (1973).
- [4076] Kimura, K., Katsumata, S., Achiba, Y., Matsumoto, H., and Nagakura, S. Photoelectron spectra and orbital structures of higher alkyl chlorides, bromides, and iodides, *Bull. Chem. Soc. Japan* **46**, 373 (1973).
- [4077] Cundy, C. S., Lappert, M. F., Pedley, J. B., Schmidt, W., and Wilkins, B. T. Bonding studies of compounds of boron and the Group IV elements. XI. Photoelectron spectra of strained cyclic organosilicon compounds, *J. Organometal. Chem.* **51**, 99 (1973).
- [4078] Sergeev, Yu. L., Akopyan, M. E., Vilesov, F. I., and Chizhov, Yu. V. Photoionization processes in gaseous cyclohexane, and chloro- and bromocyclohexane, *Khim. Vys. Energ.* **7**, 418 (1973) [Engl. transl.: *High Energy Chem.* **7**, 369 (1973)].
- [4079] Potorakov, A. P., Pirnazarova, F. N., But, P. G., Piruzyan, L. A., Chibrikov, V. M., Vikhlyayev, Yu. I., and Ul'yanova, O. V. Ionization potentials of phenothiazine derivatives and their correlation with the pharmacological effect, *Izv. Akad. Nauk SSSR, Ser. Khim.* 2106 (1973) [Engl. transl.: *Bull. Acad. Sci. USSR, Div. Chem. Sci.* **22**, 2050 (1973)].
- [4080] Mines, G. W., Thomas, R. K., and Thompson, H. The photoelectron spectra of thiocarbonyl fluoride and thiocarbonyl chloride, *Proc. Roy. Soc. Lond. A* **333**, 171 (1973).
- [4081] Schweig, A., Weidner, U., Hellwinkel, D., and Krapp, W. Spiroconjugation, *Angew. Chem. Intern. Ed.* **12**, 310 (1973).
- [4082] Kobayashi, T., and Nagakura, S. Photoelectron spectra of tetrahydropyran, 1,3-dioxane, and 1,4-dioxane, *Bull. Chem. Soc. Japan* **46**, 1558 (1973).
- [4083] Schweig, A., Weidner, U., Hill, R. K., and Cullison, D. A. A quantitative account of spiroconjugation, *J. Am. Chem. Soc.* **95**, 5426 (1973).
- [4084] Robin, M. B., Taylor, G. N., Kuebler, N. A., and Bach, R. D. Planarity of the carbon skeleton in various alkylated olefins, *J. Org. Chem.* **38**, 1049 (1973).
- [4085] Rademacher, P. Photoelectron spectra and conformation of hydrazine derivatives, *Angew. Chem. Intern. Ed.* **12**, 408 (1973).
- [4086] Vovna, V. I., Lopatin, S. N., Pettsold, R., Vilesov, F. I., and Akopyan, M. E. Photoelectron spectra of thiophosphorylchloride and some of its aminosubstituted derivatives, *Opt. i Spektrosk.* **34**, 868 (1973) [Engl. transl.: *Opt. Spectry.* **34**, 501 (1973)].
- [4087] Ogata, H., Onizuka, H., Nihei, Y., and Kamada, H. On the first bands of the photoelectron spectra of amines, alcohols, and mercaptans, *Chem. Letters* 895 (1972).
- [4088] Boschi, R., and Schmidt, W. Transannular π - π interaction in cyclophanes, *Angew. Chem. Intern. Ed.* **12**, 402 (1973).
- [4089] Johnstone, R. A. W., and Mellon, F. A. Effects of induction and resonance in the calculation of ionization potentials of substituted benzenes by perturbation molecular orbital theory, *J. Chem. Soc. Faraday Trans. II* **69**, 36 (1973).
- [4090] Schäfer, W., Schweig, A., Märkl, G., Hauptmann, H., and Mathey, F. Direct proof of the non-aromaticity of phospholes and arsoles, *Angew. Chem. Intern. Ed.* **12**, 145 (1973).
- [4091] Schmidt, H., and Schweig, A. Semiquantitative proof of hyperconjugation, *Angew. Chem. Intern. Ed.* **12**, 307 (1973).
- [4092] Bock, H., Solouki, B., Rosmus, P., and Steudel, R. Photoelectron spectra and molecular properties: SSO and OSO, *Angew. Chem. Intern. Ed.* **12**, 933 (1973).
- [4094] Reetz, M. T., Hoffmann, R. W., Schäfer, W., and Schweig, A. Methylenebicyclo [4.2.1]nona-2,4,7-triene, *Angew. Chem. Intern. Ed.* **12**, 81 (1973).
- [4095] Samson, J. A. R., and Gardner, J. L. Fluorescence excitation and photoelectron spectra of CO₂ induced by vacuum ultraviolet radiation between 185 and 716 angstroms, *J. Geophys. Res.* **78**, 3663 (1973).
- [4096] Bagarat'yan, N. V., Il'in, M. K., and Nikitin, O. T. Mass-spectrometric study of thallium metaborate, *Teplofiz. Vysokikh Temperatur* **11**, 995 (1973) [Engl. transl.: *High Temp. (USSR)* **11**, 888 (1973)].
- [4097] Benito, I., Seidl, H., and Bock, H. Efectos electronicos y estericos de sustituyentes alqulicos y silicicos sobre el sistema electronico π del estireno, *Rev. Fac. Cienc. Univ. Oviedo* **14**, 95 (1973).
- [4098] Smoes, S., and Drowart, J. Atomization energies of phosphorus oxides, *Faraday Symp. Chem. Soc.* 139 (1973).
- [4099] Tan, H.-S., and Lampe, F. W. The reaction of ethyl radicals with nitric oxide. Nitrosoethane and triethylhydroxylamine formation, *J. Phys. Chem.* **76**, 3303 (1972).
- [4100] Ames, L. L., Wang, J. L.-F., and Margrave, J. L. The vaporization of cesium nitrate, *Inorg. Nucl. Chem. Letters* **9**, 1243 (1973).
- [4102] Smoes, S., Depière, D., and Drowart, J. The atomization energies of the gaseous molecules, *Rev. Int. Hautes Temp. Refract.* **9**, 171 (1972).
- [4103] Wu, H. Y., and Wahlbeck, P. G. Vapor pressures of TiO(g) in equilibrium with Ti₂O₃(s) and Ti₃O₅(s, β); dissociation energy of TiO(g), *J. Chem. Phys.* **56**, 4534 (1972).
- [4104] Schäfer, W., and Schweig, A. Evidence against the significance of C-S hyperconjugation in determining the conformation of allyl methyl sulphide, *J. Chem. Soc. Chem. Commun.*, 824 (1972).
- [4105] Guido, M., and Balducci, G. Dissociation energy of Yb₂, *J. Chem. Phys.* **57**, 5611 (1972).
- [4106] Kobayashi, T., and Nagakura, S. Photoelectron spectra of anilines, *Chem. Letters*, 1013 (1972).
- [4107] Kobayashi, T., and Nagakura, S. Photoelectron spectra of nitro-compounds, *Chem. Letters*, 903 (1972).
- [4108] Semenov, G. A., Nikolaev, E. N., and Opendak, I. G. Mass-spectrometric investigation of the vaporisation of barium and magnesium per-rhenates, *Zh. Neorg. Khim.* **17**, 1819 (1972) [Engl. transl.: *Russ. J. Inorg. Chem.* **17**, 943 (1972)].
- [4110] Lichtenberger, D. I., and Fenski, R. F. Assignment of the photoelectron spectra of Mn(CO)₅CH₃ and Mn(CO)₅CF₃, *Inorg. Chem.* **13**, 486 (1974).
- [4111] Piacente, V., and Balducci, G. The dissociation energy of the

- molecule GaSb, High Temp. Sci. **6**, 254 (1974).
- [4112] Kohl, F. J., and Stearns, C. A. Vaporization and dissociation energies of the molecular carbides of titanium, zirconium, hafnium, and thorium, High Temp. Sci. **6**, 284 (1974).
- [4113] Farber, M., and Srivastava, R. D. Dissociation energies of BeF and BeCl and the heat of formation of BeClF, J. Chem. Soc. Faraday Trans. I **70**, 1581 (1974).
- [4114] Rauh, E. G., and Ackermann, R. J. First ionization potentials of some refractory oxide vapors, J. Chem. Phys. **60**, 1396 (1974).
- [4115] Hoffman, M. K. Hidden rearrangements in the mass spectral decomposition of cycloheptatriene, Z. Naturforsch. **29a**, 1077 (1974).
- [4116] Gambino, O., Vaglio, G. A., Ferrari, R. P., and Valle, M. Ionization and appearance potentials of cobalt carbonyl complexes, J. Organometal. Chem. **76**, 89 (1974).
- [4117] Undheim, K., El-Gendy, M. A. F., and Hurum, T. Mass spectrometry of onium compounds. XXVI. Ionisation potentials in structure analysis of gaseous aminopyridine 1-oxides, Acta Chem. Scand., Ser. B **28**, 743 (1974).
- [4118] Maeda, K., Suzuki, I. H., and Koyama, Y. Ionization efficiency curves of ethylene by electron impact, Intern. J. Mass Spectrom. Ion Phys. **14**, 273 (1974).
- [4119] Neubert, A., and Zmbov, K. F. Mass spectrometric determination of the dissociation energy of the ThO molecule, High Temp. Sci. **6**, 303 (1974).
- [4120] Gingerich, K. A., Cocke, D. L., and Kordis, J. Gaseous phosphorus compounds. X. Mass spectrometric determination of the dissociation energies of arsenic and bismuth monophosphides, J. Phys. Chem. **78**, 603 (1974).
- [4121] Dube, G., and Chvalovsky, V. Electron impact fragmentation of silyl-substituted phenyldimethylsilanes, Coll. Czech. Chem. Commun. **39**, 2641 (1974).
- [4122] Hirayama, C., Castle, P. M., Liebermann, R. W., Zollweg, R. J., and Camp, F. E. Vapor pressure of samarium diiodide and mass spectra of vapors over samarium diiodide and thulium triiodide, Inorg. Chem. **13**, 2804 (1974).
- [4123] Hildenbrand, D. L., and Murad, E. Ionization potential of thorium, J. Chem. Phys. **61**, 5466 (1974).
- [4124] Beauchamp, J. L., Caserio, M. C., and McMahon, T. B. Ion-molecule reactions of *tert*-butyl alcohol by ion cyclotron resonance spectroscopy, J. Am. Chem. Soc. **96**, 6243 (1974).
- [4125] Dube, G., and Chvalovsky, V. Electron impact fragmentation of substituted phenyldimethylsilanes, Coll. Czech. Chem. Commun. **39**, 2621 (1974).
- [4126] MacLean, D. I., and Sacher, R. E. A study of some spectroscopic properties of Group IVA acetylides, J. Organometal. Chem. **74**, 197 (1974).
- [4127] Price, S. J. W., and Sapiano, H. J. C₆F₅X bond dissociation energies: determination from appearance potential measurements and correlation with thermochemical data, Can. J. Chem. **52**, 4109 (1974).
- [4128] Wagner, L. C., and Grimley, R. T. A mass spectrometric study of the bismuth vapor system by the angular distribution technique, Chem. Phys. Letters **29**, 594 (1974).
- [4129] Crowe, A., and McConkey, J. W. Dissociative ionization by electron impact. III. O⁺, CO⁺ and C⁺ from CO₂, J. Phys. B. **7**, 349 (1974).
- [4130] Gingerich, K. A. Thermodynamic evidence for quadruple bond formation in the molecule ThRu and possible maximum bond energy between ligand-free metal atoms, Chem. Phys. Letters **25**, 523 (1974).
- [4131] Bennett, S. L., Lin, S.-S., and Gilles, P. W. High-temperature vaporization of ternary systems. I. Mass spectrometry of oxygen-rich vanadium-tungsten-oxygen species, J. Phys. Chem. **78**, 266 (1974).
- [4132] Evans, S., Green, J. C., Jackson, S. E., and Higginson, B. He(I) photoelectron spectra of some transition-metal sandwich complexes, J. Chem. Soc. Dalton Trans., 304 (1974).
- [4133] Yoshikawa, K., Hashimoto, M., and Morishima, I. Photoelectron spectroscopic study of cyclic amines. The relation between ionization potentials, basicities, and character of the nitrogen lone pair electrons, J. Am. Chem. Soc. **96**, 288 (1974).
- [4134] Nelsen, S. F., and Buschek, J. M. Photoelectron spectra of hydrazines. V. Pyrazolidine and hexahydropyridazine derivatives, J. Am. Chem. Soc. **96**, 6987 (1974).
- [4135] Schmidt, H., Schweig, A., Trost, B. M., Neubold, H. B., and Scudder, P. H. Influence of geometry on cyclopropyl participation in the thermolysis of azo compounds. A photoelectron spectroscopic rationalization, J. Am. Chem. Soc. **96**, 622 (1974).
- [4136] Schmidt, H., Schweig, A., Anastassiou, A. G., and Yamamoto, H. Photoelectron spectroscopic evidence for bicycloconjugation in 9-azabicyclo[4,2,1]nona-2,4,7-triene, J. Chem. Soc. Chem. Commun., 218 (1974).
- [4137] Nelsen, S. F., and Buschek, J. M. Photoelectron spectra of hydrazines. III. Evidence for similar lone pair-lone pair dihedral angles for acyclic hydrazines, J. Am. Chem. Soc. **96**, 2392 (1974).
- [4138] Westwood, N. P. C. The photoelectron spectrum of silicon difluoride, Chem. Phys. Letters **25**, 558 (1974).
- [4139] Ramsey, B. G., Brock, A., Bassindale, A. R., and Bock, H. $\sigma\pi^*$, a reassignment of the long wavelength UV transition in acyl-silanes and -germanes by photoelectron spectroscopy, J. Organometal. Chem. **74**, C41 (1974).
- [4140] Bünzli, J. C., Frost, D. C., and Weiler, L. Photoelectron spectrum of tropone. Inductive effect of carbonyl group, J. Am. Chem. Soc. **96**, 1952 (1974).
- [4141] Nelsen, S. F., and Buschek, J. M. Photoelectron spectra of some cyclic di- and polyamines. Lone pair-lone pair interaction in 1,3- and 1,4-diamines, J. Am. Chem. Soc. **96**, 7930 (1974).
- [4142] Martin, H.-D., Heller, C., Haselbach, E., and Lanyjova, Z. Quadricyclanes. Part I: photoelectron spectra and electronic structure, Helv. Chim. Acta **57**, 465 (1974).
- [4143] Maier, J. P. Photoelectron spectroscopy of *peri*-amino naphthalenes, Helv. Chim. Acta **57**, 994 (1974).
- [4144] Raymond, J. W., Edwards, L. O., and Russell, B. R. Vacuum ultraviolet absorption spectra of some chloroalkanes, J. Am. Chem. Soc. **96**, 1708 (1974).
- [4145] Pignataro, S., and Distefano, G. $n-\sigma$ mixing in pentatomic heterocyclic compounds of sixth group by photoelectron spectroscopy, Chem. Phys. Letters **26**, 356 (1974).
- [4146] Nicholson, D. G., and Rademacher, P. Photoelectron spectra and electronic structures of antimony(III) halides, Acta Chem. Scand. Ser. A **28**, 1136 (1974).
- [4147] Liu, M. B., and Wahlbeck, P. G. Knudsen effusion and mass spectrometric studies of the vaporization of Y₂O₃(s). Dissociation energy of YO(g), High Temp. Sci. **6**, 179 (1974).
- [4149] Mines, G. W., and Thomas, R. K. The photoelectron spectrum of sulphur trioxide: Jahn-Teller distortion in SO₃⁺, Proc. Roy. Soc. (London) A **336**, 355 (1974).
- [4150] Solouki, B., Rosmus, P., and Bock, H. Photoelectron spectra and molecular properties. SCl₂-ionization potentials and ab initio SCF calculations, Chem. Phys. Letters **26**, 20 (1974).
- [4152] Staley, R. H., and Beauchamp, J. L. Basicities and ion-molecule reactions of the methylphosphines in the gas phase by ion cyclotron resonance spectroscopy, J. Am. Chem. Soc. **96**, 6252 (1974).
- [4153] Distefano, G., Ricci, A., Colonna, F. P., Pietropaolo, D., and Pignataro, S. Bonding between sulfur and the elements of Group IV studied by UV photoelectron spectroscopy, J. Organometal. Chem. **78**, 93 (1974).
- [4154] Debies, T. P., and Rabalais, J. W. Photoelectron spectra of

- substituted benzenes. III. Bonding with Group V substituents, *Inorg. Chem.* **13**, 308 (1974).
- [4155] Berlinsky, A. J., Carolan, J. F., and Weiler, L. Photoelectron spectrum and electronic structure of tetrathiofulvalene (TTF), *Can. J. Chem.* **52**, 3373 (1974).
- [4156] Nelsen, S. F., and Buschek, J. M. Photoelectron spectra of hydrazines. IV. Empirical estimation of lone pair-lone pair dihedral angles and prediction of lone pair ionization potentials for some cyclic and bicyclic hydrazines, *J. Am. Chem. Soc.* **96**, 6982 (1974).
- [4157] Harris, D. H., and Lappert, M. F. Monomeric, volatile bivalent amides of Group IV_B elements, $M(NR^1)_2$ and $M(NR^1R^2)_2$ ($M = \text{Ge, Sn or Pb}$; $R^1 = \text{Me}_3\text{Si}$, $R^2 = \text{Me}_3\text{C}$), *J. Chem. Soc. Chem. Commun.*, 895 (1974).
- [4158] Heilbronner, E., and Maier, J. P. Consequences of substitution in the photoelectron spectra of [2,2] paracyclophanes: separation of 'through-space' and 'through-bond' interactions as a consequence of fluorosubstitution, *Helv. Chim. Acta* **57**, 151 (1974).
- [4159] Haink, H. J., Adams, J. E., and Huber, J. R. The electronic structure of aromatic amines: photoelectron spectroscopy of diphenylamine, iminobenzyl, acridan and carbazole, *Ber. Bunsenges.* **78**, 436 (1974).
- [4160] Ensslin, W., Bock, H., and Becker, G. Photoelectron spectra and molecular properties. XXX. π interactions in H_3Si - and H_3C -substituted acetylenes, *J. Am. Chem. Soc.* **96**, 2757 (1974).
- [4161] Bischof, P., Gleiter, R., and Hofmann, P. Reversal in the sequence of the two highest occupied molecular orbitals in the series pyrazine, 2,6-dimethylpyrazine, and tetramethylpyrazine, *J. Chem. Soc. Chem. Commun.*, 767 (1974).
- [4162] Heilbronner, E., Hornung, V., Maier, J. P., and Kloster-Jensen, E. The photoelectron spectra of halodiacetylenes, dihalodiacetylenes, and halomethyldiacetylenes, *J. Am. Chem. Soc.* **96**, 4252 (1974).
- [4163] Sasaki, T., Eguchi, S., Kiriyama, T., Sakito, Y., and Kato, H. Photoelectron spectroscopic evidence concerning ground-state through- σ -bond interaction in the 1,3-diazadamantan-6-one system, *J. Chem. Soc. Chem. Commun.*, 725 (1974).
- [4165] Freiser, B. S., and Beauchamp, J. L. Gas phase ion chemistry and photochemistry of ions generated from perfluoropropylene. Photodissociation of the perfluoroallyl cation, *J. Am. Chem. Soc.* **96**, 6260 (1974).
- [4166] Evans, S., Hamnett, A., and Orchard, A. F. Concerning the ultraviolet photoelectron spectra of osmium and ruthenium tetroxide, *J. Am. Chem. Soc.* **96**, 6221 (1974).
- [4167] Ceasar, G. P., Milazzo, P., Cihonski, J. L., and Levenson, R. A. Photoelectron spectra of the rhenium pentacarbonyl halides, *Inorg. Chem.* **13**, 3035 (1974).
- [4168] Osafune, K., and Kimura, K. Photoelectron spectroscopic study of hydrogen peroxide, *Chem. Phys. Letters* **25**, 47 (1974).
- [4169] Brundle, C. R. He (I) and He (II) photoelectron spectra of ozone, *Chem. Phys. Letters* **26**, 25 (1974).
- [4170] Frost, D. C., Lee, S. T., and McDowell, C. A. High resolution photoelectron spectroscopy of ozone, *Chem. Phys. Letters* **24**, 149 (1974).
- [4171] Hino, S., and Inokuchi, H. Photoelectron spectrum (He I) of 9-methylantracene, *Chem. Letters*, 363 (1974).
- [4172] Schweig, A., Weidner, U., and Manuel, G. Theory and application of photoelectron spectroscopy. XLIV. A quantitative account of hyperconjugation in allyl and benzyl compounds of elements of Group IVB, *J. Organometal. Chem.* **67**, C4 (1974).
- [4173] Fedorova, M. S., Potapov, V. K., Denisov, Yu. V., Sorokin, V. V., and Evlasheva, T. I. A mass-spectrometric study of the photoionisation of certain cyclic hydrocarbons, *Zh. Fiz. Khim.* **48**, 1828 (1974) [Engl. transl.: *Russ. J. Phys. Chem.* **48**, 1078 (1974)].
- [4174] Gorodyskii, V. A., Pozdnyakov, V. P., Siretskii, Yu. G., Fadeeva, I. I., and Kozlov, L. P. The structures and properties of complexes of tetranitromethane and pyromellitic dianhydride with hydrocarbons of the benzene-tetracene series. II. Spectroscopic and thermodynamic characteristics, *Zh. Fiz. Khim.* **48**, 2190 (1974) [Engl. transl.: *Russ. J. Phys. Chem.* **48**, 1298 (1974)].
- [4175] Radziemski, L. J., Jr., and Kaufman, V. Wavelengths, energy levels, and analysis of the second spectrum of chlorine (Cl II), *J. Opt. Soc. Am.* **64**, 366 (1974).
- [4176] Sasanuma, M.; Morioka, Y., Ishiguro, E., and Nakamura, M. Rydberg series in the NO molecule near 600 Å, *J. Chem. Phys.* **60**, 327 (1974).
- [4177] Warneck, P. Heat of formation of the HCO radical, *Z. Naturforsch.* **29a**, 350 (1974).
- [4178] Grönneberg, T., Hurum, T., and Undheim, K. Ionisation potentials in structure analysis of gaseous hydroxypyridine 1-oxides, *Acta Chem. Scand., Ser. B* **28**, 986 (1974).
- [4179] Cradock, S., Findlay, R. H., and Palmer, M. H. Bonding in methyl- and silyl-cyclopentadiene compounds: a study by photoelectron spectroscopy and *ab initio* molecular-orbital calculations, *J. Chem. Soc., Dalton Trans.*, 1650 (1974).
- [4180] Bieri, G., Heilbronner, E., Kloster-Jensen, E., Schmelzer, A., and Wirz, J. Electronic states of 1,5-cyclooctadiyne radical cation and of related systems: the electronic structure of *cis*-bent carbon-carbon triple bonds, *Helv. Chim. Acta* **57**, 1265 (1974).
- [4181] Starzewski, K. A. O., Dieck, H. t., and Bock, H. Photoelectron spectra and molecular properties. XXIII. Photoelectron spectra of silicon-substituted ylidic systems, *J. Organometal. Chem.* **65**, 311 (1974).
- [4182] Brown, C. M., Tilford, S. G., and Ginter, M. L. Absorption spectrum of B I in the 1350-1900-Å region, *J. Opt. Soc. Am.* **64**, 877 (1974).
- [4183] Colin, R., DeGreef, D., Goethals, P., and Verhaegen, G. The ionization potential of the BeH molecule, *Chem. Phys. Letters* **25**, 70 (1974).
- [4184] Dorko, E. A., Scheps, R., and Rice, S. A. Comments on the ultraviolet spectrum and photophysical properties of trimethylenecyclopropane, *J. Phys. Chem.* **78**, 568 (1974).
- [4185] Cowley, A. H., Dewar, M. J. S., Goodman, D. W., and Padolina, M. C. Detection of rotational isomerism in diphosphines and diarsines by photoelectron spectroscopy, *J. Am. Chem. Soc.* **96**, 2648 (1974).
- [4186] Golob, L., Jonathan, N., Morris, A., Okuda, M., Ross, K. J., and Smith, D. J. Vacuum ultraviolet photoelectron spectroscopy of transient species: the $\text{SO}(\Sigma)$ radical, *Ber. Bunsenges.* **78**, 201 (1974).
- [4187] Bassett, P. J., Higginson, B. R., Lloyd, D. R., Lynaugh, N., and Roberts, P. J. Helium-I photoelectron spectra of tetrakis(trifluorophosphine)-nickel(0), -palladium(0), and -platinum(0), *J. Chem. Soc., Dalton. Trans.*, 2316 (1974).
- [4188] Colton, R. J., and Rabalais, J. W. Photoelectron and electronic absorption spectra of SCl_2 , S_2Cl_2 , S_2Br_2 and $(\text{CH}_3)_2\text{S}_2$, *J. Electron Spectrosc. Relat. Phenom.* **3**, 345 (1974).
- [4189] Batich, C., Heilbronner, E., Rommel, E., Semmelhack, M. F., and Foos, J. S. Equivalence of the energy gaps $\Delta\text{I}(1,2)$ and $\Delta\text{E}(1,2)$ between corresponding bands in the photoelectron (I) and electronic absorption (E) spectra of spiro[4.4] nonatetraene. An amusing consequence of spiroconjugation, *J. Am. Chem. Soc.* **96**, 7662 (1974).
- [4191] Cowley, A. H., Dewar, M. J. S., Goodman, D. W., and Padolina, M. C. A Photoelectron spectroscopic study of polyphosphines. The question of $p\pi:d\pi$ bonding, *J. Am. Chem. Soc.* **96**, 3666 (1974).

- [4192] Akopyan, M. E., and Loginov, Yu. V. Photoelectron spectra of trimethylamine derivatives, *Opt. Spektrosk.* **37**, 442 (1974) [Engl. transl.: *Opt. Spectrosc.* **37**, 250 (1974)].
- [4193] Dromey, R. G., and Peel, J. B. Photoelectron spectroscopic correlation of the molecular orbitals of the alkanes and alkyl iodides, *J. Mol. Struct.* **23**, 53 (1974).
- [4194] Boschi, R. A. A., and Salahub, D. R. The high resolution photoelectron spectra of some iodoalkanes, iodocycloalkanes, iodoalkenes, and fluoroiodohydrocarbons, *Can. J. Chem.* **52**, 1217 (1974).
- [4195] Schweig, A., Vermeer, H., and Weidner, U. A photoelectron spectroscopic study of keto-enol tautomerism in acetylacetones - a new application of photoelectron spectroscopy, *Chem. Phys. Letters* **26**, 229 (1974).
- [4196] Boschi, R., Clar, E., and Schmidt, W. Photoelectron spectra of polynuclear aromatics. III. The effect of nonplanarity in sterically overcrowded aromatic hydrocarbons, *J. Chem. Phys.* **60**, 4406 (1974).
- [4197] Suzuki, I. H., and Maeda, K. Ionization efficiency curves and fragmentations of deuterated ethylenes by electron impact, *Intern. J. Mass Spectrom. Ion Phys.* **15**, 281 (1974).
- [4198] Distefano, G., Ricci, A., Danieli, R., Foffani, A., Innorta, G., and Torroni, S. Mass Spectrometric evidence for p_π - d_π bonding between sulfur and the Group IVB elements, *J. Organometal. Chem.* **65**, 205 (1974).
- [4199] Loudon, A. G., and Mazengo, R. Z. Steric strain and electron-impact. The behaviour of some n,n' -dimethyl-1,1'-binaphthyls, some n,n' -dimethylbiphenyls and model compounds, *Org. Mass Spectrom.* **8**, 179 (1974).
- [4200] Muenow, D. W. Mass spectrometric determination of the heats of formation and atomization energies of the molecules Ge_2N and GeSiN , *J. Chem. Phys.* **60**, 3382 (1974).
- [4201] Tsuji, K., Saito, M., and Tani, T. Ionization potentials of phenylenediamines and steric effect in the ortho isomer, *Denki Kagaku Oyobi Kogyo Butsuri Kagaku* **41**, 688 (1973).
- [4202] Owzarski, T. P., and Franzen, H. F. High temperature mass spectrometry, vaporization, and thermodynamics of vanadium monosulfide, *J. Chem. Phys.* **60**, 1113 (1974).
- [4203] Holmes, J. L. The mass spectra of isomeric hydrocarbons - II: The C_7H_8 isomers, spiropentane, cyclopentene, 1,3-pentadiene and isoprene; the mechanisms and energetics of their fragmentations, *Org. Mass Spectrom.* **8**, 247 (1974).
- [4204] Clark, H. C., and Rake, A. T. Mass spectrometry of systems containing a Group IVB - transition metal bond. I. The phenyl- and pentafluorophenyl-silicon, -germanium and -tin derivatives of pentacarbonylmanganese, *J. Organometal. Chem.* **82**, 159 (1974).
- [4205] Guido, M., and Gigli, G. Mass spectrometric study of the gaseous gallium monocyanide, *J. Chem. Phys.* **60**, 721 (1974).
- [4206] Cocke, D. L., and Gingerich, K. A. Thermodynamic investigation of the gaseous molecules TiRh , Rh_2 , and Ti_2Rh by mass spectrometry, *J. Chem. Phys.* **60**, 1958 (1974).
- [4207] Kohl, F. J., and Stearns, C. A. Identification and dissociation energy of gaseous hafnium mononitride, *J. Phys. Chem.* **78**, 273 (1974).
- [4208] Hildenbrand, D. L., and Murad, E. Mass spectrometric studies of gaseous ThO and ThO_2 , *J. Chem. Phys.* **61**, 1232 (1974).
- [4209] Gingerich, K. A. Mass spectrometric evidence for the very high stability of diatomic cerium compounds with some platinum metals and predicted dissociation energies of selected diatomic intermetallic compounds with multiple bonds, *J. Chem. Soc. Faraday Trans. II* **70**, 471 (1974).
- [4210] Martin, W. C., Hagan, L., Reader, J., and Sugar, J. Ground levels and ionization potentials for lanthanide and actinide atoms and ions, *J. Phys. Chem. Ref. Data* **3**, 771 (1974).
- [4211] Eaton, D. F., and Traylor, T. G. Distortional stabilization in phenyl participations, *J. Am. Chem. Soc.* **96**, 7109 (1974).
- [4212] Kroto, H. W., Landsberg, B. M., Suffolk, R. J., and Vodden, A. The photoelectron and microwave spectra of the unstable species thioacetaldehyde, CH_3CHS , and thioacetone, $(\text{CH}_3)_2\text{CS}$, *Chem. Phys. Letters* **29**, 265 (1974).
- [4213] Taylor, L. T., and Dillard, J. G. Mass spectrometric study of polydentate Schiff base coordination complexes. II. Cobalt(II), nickel(II), and copper(II) complexes of $\text{N,N}'$ -bis(salicylidene)heptanediamine, $\text{N,N}'$ -bis(salicylidene)-3,3'-bis(aminopropyl)amine, $\text{N,N}'$ -bis(salicylidene)-3,3'-bis(aminopropyl) ether, and $\text{N,N}'$ -bis(salicylidene)-3,3'-bis(aminopropyl) sulfide, *Inorg. Chem.* **13**, 2620 (1974).
- [4214] Nelsen, S. F., and Buschek, J. M. Charge delocalization in saturated systems. The radical cation of 1,3,6,8-tetraazatricyclo[4.4.1.1^{3,6}]dodecane, *J. Am. Chem. Soc.* **96**, 6424 (1974).
- [4215] Dehmer, J. L., Berkowitz, J., Cusachs, L. C., and Aldrich, H. S. Photoelectron spectroscopy of high temperature vapors. V. Hel spectra of GaX_3 and InX_3 ($\text{X}=\text{Cl}, \text{Br}, \text{I}$), *J. Chem. Phys.* **61**, 594 (1974).
- [4216] Kaving, B., and Lindgren, B. Ultraviolet absorption spectrum of the CaH molecule. II. The structure of the d-complex around 2850 Å, *Physica Scripta* **10**, 81 (1974).
- [4217] Worrell, C., Verhoeven, J. W., and Speckamp, W. N. Through-bond interaction in 1-aza-adamantane derivatives, *Tetrahedron* **30**, 3525 (1974).
- [4218] Baker, A. D., Brisk, M., and Gellender, M. Photoelectron spectra and dihedral angles of disulfides, *J. Electron Spectrosc. Relat. Phenom.* **3**, 227 (1974).
- [4219] Yokoyama, Y., Jinno, M., Watanabe, I., and Ikeda, S. Identification of accidentally degenerate bands in UV photoelectron spectra of ethylene carbonate and propylene carbonate, *J. Electron Spectrosc. Relat. Phenom.* **5**, 1095 (1974).
- [4220] Chadwick, D., and Katrib, A. Photoelectron spectra of acetaldehyde and acetyl halides, *J. Electron Spectrosc. Relat. Phenom.* **3**, 39 (1974).
- [4221] Debies, T. P., and Rabalais, J. W. Electronic structure of amino acids and ureas, *J. Electron Spectrosc. Relat. Phenom.* **3**, 315 (1974).
- [4222] Weiner, M. A., and Lattman, M. Photoelectron spectra of 4-substituted pyridine N-oxides, *Tetrahedron Letters*, 1709 (1974).
- [4223] McLafferty, F. W., and Winkler, J. Gaseous tropylium, benzyl, tolyl, and norbornadienyl cations, *J. Am. Chem. Soc.* **96**, 5182 (1974).
- [4224] Tam, W.-C., Yee, D., and Brion, C. E. Photoelectron spectra of some aldehydes and ketones, *J. Electron Spectrosc. Relat. Phenom.* **4**, 77 (1974).
- [4225] White, R. M., Carlson, T. A., and Spears, D. P. Angular distribution of the photoelectron spectra for ethylene, propylene, butene and butadiene, *J. Electron Spectrosc. Relat. Phenom.* **3**, 59 (1974).
- [4226] Elbel, S., Bergmann, H., Enßlin, W. Photoelectron spectra of the trimethyl compounds of the Group V elements, *J. Chem. Soc. Faraday Trans. II* **70**, 555 (1974).
- [4228] Terlouw, J. K., Heerma, W., Frintrop, P. C. M., Dijkstra, G., and Meinema, H. A. Electron-impact induced fragmentation of some heterocyclic-tin compounds, *J. Organometal. Chem.* **64**, 205 (1974).
- [4229] Barrow, R. F., Kopp, I., and Malmberg, C. The electronic spectrum of gaseous AlF , *Physica Scripta*, **10**, 86 (1974).
- [4230] Dyke, J. M., Golob, L., Jonathan, N., Morris, A., Okuda, M., and Smith, D. J. Vacuum ultraviolet photoelectron spectroscopy of transient species. Part 3. The $\text{SO}(\Sigma^-)$

- radical, *J. Chem. Soc. Faraday Trans. II* **70**, 1818 (1974).
- [4231] Koenig, T., Tuttle, M., and Wielesek, R. A. The He(I) photoelectron spectra of xylenes and metacyclophanes. A reassignment of the lowest ionic state of [2.2] metacyclophane, *Tetrahedron Letters*, 2537 (1974).
- [4232] Berkowitz, J. PES of high-temperature vapors. VI. 304 Å and 584 Å PES of Zn, Cd, and Hg halides and the electronegativity scale, *J. Chem. Phys.* **61**, 407 (1974).
- [4233] Kelder, J., Cerfontain, H., Higginson, B. R., and Lloyd, D. R. Photoelectron and ultraviolet absorption spectra of cyclopropyl conjugated 1,2-diketones, *Tetrahedron Letters*, 739 (1974).
- [4234] Evans, S., Guest, M. F., Hillier, I. H., and Orchard, A. F. Theoretical and experimental study of the low energy ionic states of π -cyclopentadienyl- nickel nitrosyl, *J. Chem. Soc., Faraday Trans. II* **70**, 417 (1974).
- [4235] Gavin, R. M., Jr., and Rice, S. A. Spectroscopic properties of polyenes. II. The vacuum ultraviolet spectra of *cis*- and *trans*-1,3,5-hexatriene, *J. Chem. Phys.* **60**, 3231 (1974).
- [4236] Wagner, L. C., Robert, P., Grindstaff, Q., and Grimley, R. T. A mass spectrometric study of the fragmentation of the cuprous chloride vapor system, *Intern. J. Mass Spectrom. Ion Phys.* **15**, 255 (1974).
- [4237] Eidelsberg, M. The spectrum and term system of helium-like boron, *B IV*, *J. Phys. B* **7**, 1476 (1974).
- [4238] McDiarmid, R. Assignments of Rydberg and valence transitions in the electronic absorption spectrum of dimethyl sulfide, *J. Chem. Phys.* **61**, 274 (1974).
- [4239] Dyke, J. M., Golob, L., Jonathan, N., Morris, A., and Okuda, M. Vacuum ultraviolet photoelectron spectroscopy of transient species. Part 4. Difluoromethylene and ozone, *J. Chem. Soc., Faraday Trans. II* **70**, 1828 (1974).
- [4240] Kobayashi, T., and Nagakura, S. Photoelectron spectra of aminopyridines and cyanopyridines, *J. Electron Spectrosc. Relat. Phenom.* **4**, 207 (1974).
- [4241] Brown, R. S., Eaton, D. F., Hosomi, A., Traylor, T. G., and Wright, J. M. Photoelectron spectra of cyclopropylcarbonyltrimethyltin and allyltrimethyltin. A comparison of σ - σ and σ - π conjugation, *J. Organometal. Chem.* **66**, 249 (1974).
- [4242] Lappert, M. F., Pedley, J. B., and Sharp, G. Bonding studies of transition metal complexes. I. He(I) photoelectron spectra of *d'* silylmethyl and neopentyl derivatives of Group IVA metals, *J. Organometal. Chem.* **66**, 271 (1974).
- [4243] Fuss, W., and Bock, H. Photoelectron spectra and molecular properties. XXXVI. $(H_3C)_3B$, $(H_3C)_2BF$, $(H_3C)_2BN(CH_3)_2$, and $(H_3C)_2CC(CH_3)_2$: The use of ionization potentials in assigning UV spectra, *J. Chem. Phys.* **61**, 1613 (1974).
- [4244] Rosmus, P., Dacre, P. D., Solouki, B., and Bock, H. Hartree-Fock calculations and photoelectron spectra of SSO and NSF, *Theoret. Chim. Acta* **35**, 129 (1974).
- [4245] Maleev, A. N., Semenov, G. A., and Kholodov, A. I. Evaporator with gas flooding for high-temperature thermodynamic investigations on a mass spectrometer, *Zavod. Lab.* **40**, 987 (1974) [Engl. transl.: *Ind. Lab. (USSR)* **40**, 1179 (1974)].
- [4246] Planckaert, A. A., Doucet, J., and Sandorfy, C. Comparative study of the vacuum ultraviolet absorption and photoelectron spectra of some simple ethers and thioethers, *J. Chem. Phys.* **60**, 4846 (1974).
- [4247] Eland, J. H. D. Predissociation of triatomic ions studied by photoelectron-photoion coincidence spectroscopy, *Advan. Mass Spectrom.* **6**, 917 (1974).
- [4248] Lee, T. H., and Rabalais, J. W. Vibrational transition probabilities in photoelectron spectra, *J. Chem. Phys.* **61**, 2747 (1974).
- [4249] Asmus, P., and Klessinger, M. Photoelectron spectra of organic compounds. VI. Exocyclic methylene compounds, *Tetrahedron* **30**, 2477 (1974).
- [4250] Aarons, L. J., Connor, J. A., Hillier, I. H., Schwarz, M., and Lloyd, D. R. Electronic structure of diazocyclopentadiene. A study using low and high energy photoelectron spectroscopy and *ab initio* molecular orbital calculations, *J. Chem. Soc., Faraday Trans. II* **70**, 1106 (1974).
- [4251] Batich, C., and Adam, W. The photoelectron spectra of alkylperoxides, *Tetrahedron Letters*, 1467 (1974).
- [4252] Higginson, B. R., Lloyd, D. R., Connor, J. A., and Hillier, I. H. Photoelectron studies of metal carbonyls. Part 4. Mono-substituted complexes of chromium and tungsten carbonyls, *J. Chem. Soc., Faraday Trans. II* **70**, 1418 (1974).
- [4253] Guimon, C., Pfister-Guillouzo, G., Arbelot, M., and Chanon, M. Electronic structure of sulphur compounds. VII. Photoelectron spectra of thiocarbonyl heterocycles, *Tetrahedron* **30**, 3831 (1974).
- [4254] Connors, R. E., Roebber, J. L., and Weiss, K. Vacuum ultraviolet spectroscopy of cyanogen and cyanoacetylenes, *J. Chem. Phys.* **60**, 5011 (1974).
- [4255] Koenig, T., and Longmaid, H. Photoelectron spectra of 1,4-dihydropyridine and *N*-methyl-1,4-dihydropyridine, *J. Org. Chem.* **39**, 560 (1974).
- [4256] Lappert, M. F., Pedley, J. B., Sharp, G. J., and Westwood, N. P. C. Bonding studies of compounds of boron and the Group III and IV elements. XII. Variable temperature He I photoelectron spectra of Group III halides, $2MX_3 \rightleftharpoons M_2X_6$ ($M = Al$ or Ga , $X = Cl$, Br , or I), *J. Electron Spectrosc. Relat. Phenom.* **3**, 237 (1974).
- [4258] Bodor, N., Chen, B. H., and Worley, S. D. Photoelectron spectra and SCF MO calculations for the dimers of cyclobutadiene, *J. Electron Spectrosc. Relat. Phenom.* **4**, 65 (1974).
- [4259] Bischof, P., Gleiter, R., Kukla, M. J., and Paquette, L. A. The photoelectron spectra of tricyclo[3.3.0.0^{2,6}]octene and tricyclo[3.3.0.0^{2,7}]octane, *J. Electron Spectrosc. Relat. Phenom.* **4**, 177 (1974).
- [4260] Worrell, C. W. The photoelectron and absorption spectra of allyl halides, *J. Electron Spectrosc. Relat. Phenom.* **3**, 359 (1974).
- [4261] Cowley, A. H., Dewar, M. J. S., Gilje, J. W., Goodman, D. W., and Schweiger, J. R. Relationship between the photoelectron spectra and torsional barriers of aminophosphines, *J. Chem. Soc. Chem. Commun.*, 340 (1974).
- [4262] Schäfer, W., Schweig, A., Bickelhaupt, F., and Vermeer, H. The electronic structure of a λ_1 -phosphaphenanthrene; a direct indication of the similarity of electronic effects produced by sp^2 hybridized carbon and phosphorus atoms, *Recl. Trav. Chim. Pays-Bas* **93**, 1 (1974).
- [4263] Batich, C., Heilbronner, E., and Vogel, E. The ionization energies of bridged [14]annulenes and of dicyclohepta[*cd, gh*]pentalene, *Helv. Chim. Acta* **57**, 2288 (1974).
- [4264] Van Deurzen, C. H. H., Conway, J. G., and Davis, S. P. Spectrum and energy levels of quadruple-ionized vanadium (V v), *J. Opt. Soc. Am.* **64**, 498 (1974).
- [4265] Roberts, P. Ph.D. Thesis (Univ. Birmingham, 1974).
- [4266] Akopyan, M. E., and Timoshenko, M. M. A photoelectron spectrometer for investigating vapors of nonvolatile substances, *Prib. Tekh. Eksp.*, 164 (1974) [Engl. transl.: *Instrum. Exp. Tech.*, 185 (1974)].
- [4267] Clary, D. C., Lewis, A. A., Morland, D., Murrell, J. N., and Heilbronner, E. Ionization potentials of cycloalkenes, *J. Chem. Soc., Faraday Trans. II* **70**, 1889 (1974).
- [4268] Bischof, P., Gleiter, R., de Meijere, A., and Meyer, L.-U. The conjugative interaction between π -orbitals and cyclobutane-orbitals in spiro[3.4]octa-5,7-diene and spiro[3.4]octene-5, *Helv. Chim. Acta* **57**, 1519 (1974).
- [4269] Almemark, M., Backvall, J. E., Moberg, C., Åkermark, B., Åsbrink, L., and Roos, B. *Ab initio* calculations and

- assignment of photoelectron spectra of maleic and succinic anhydride, *Tetrahedron* **30**, 2503 (1974).
- [4270] Harshbarger, W. R., Kuebler, N. A., and Robin, M. B. Electronic structure and spectra of small rings. V. Photoelectron and electron impact spectra of cyclopropenone, *J. Chem. Phys.* **60**, 345 (1974).
- [4271] Gilbert, R., and Sandorfy, C. Rydberg transitions in the ultraviolet spectra of difluorobenzenes, *Chem. Phys. Letters* **27**, 457 (1974).
- [4272] Aloisi, G. G., Santini, S., and Sorriso, S. Molecular complexes of substituted diphenyl sulphides with π acceptors. Charge transfer spectra and ionization potentials of the donors, *J. Chem. Soc., Faraday Trans. I* **70**, 1908 (1974).
- [4274] Bock, H., and Seidl, H. "d-Orbital effects" in silicon-substituted π -electron systems. XI. Syntheses and properties of the isomeric bis(trimethylsilyl)-1,3-butadienes, *J. Am. Chem. Soc.* **90**, 5694 (1968).
- [4275] Maier, J. P., and Muller, J.-F. Ionisation energies of pyridine N-oxides determined by photoelectron spectroscopy, *J. Chem. Soc., Faraday Trans. II* **70**, 1991 (1974).
- [4276] Wagner, G., and Bock, H. Photoelektronenspektren und Moleküleigenschaften, XXVI. Die Delokalisation von Schwefel-Elektronenpaaren in Alkylsulfiden und -disulfiden, *Chem. Ber.* **107**, 68 (1974).
- [4277] Rademacher, P. Photoelectron spectra and conformation of cyclic N,N'-dimethylhydrazines, *Tetrahedron Letters*, 83 (1974).
- [4278] Bodor, N., Kaminski, J. J., Worley, S. D., Colton, R. J., Lee, T. H., and Rabalais, J. W. Photoelectron spectra, hydrolytic stability, and antimicrobial activity of N-chlorinated piperidines, *J. Pharm. Sci.* **63**, 1387 (1974).
- [4279] Vilesov, F. I., Lopatin, S. N., Vovna, V. I., Paetzold, R., and Niendorf, K. Untersuchungen an Molekülkomplexen. 3. Mitteilung: Zusammenhang zwischen der Ionisierungsenergie von $R_1R_2R_3PS$ -Molekülen und der Stabilität ihrer Molekülkomplexe mit Jod, *Z. Phys. Chem. (Leipzig)* **255**, 661 (1974).
- [4280] Bischof, P. K., Dewar, M. J. S., Goodman, D. W., and Jones, T. B. Photoelectron spectra of molecules. VI. Hyperconjugation versus p_π - d_π bonding in group IVb compounds, *J. Organometal. Chem.* **82**, 89 (1974).
- [4281] Martin, H.-D., Kagabu, S., and Schwesinger, R. Photoelektronenspektroskopische Untersuchung der intramolekularen π , π -Wechselwirkungen in *endo*-Tricyclo[4.2.1.0^{2,5}]-nonadienen. Homokonjugation mit Cyclobutanen, *Chem. Ber.* **107**, 3130 (1974).
- [4284] Harada, Y., Ohno, K., Seki, K., and Inokuchi, H. Photoelectron spectrum of dispiro[2.2.2]deca-4,9-diene. Conjugation of Walsh orbitals of cyclopropane rings with orbitals of diene, *Chem. Letters*, 1081 (1974).
- [4285] Hentrich, G., Gunkel, E., and Klessinger, M. Photoelektronenspektren organischer Verbindungen. 4. Photoelektronenspektren ungesättigter Carbonylverbindungen, *J. Mol. Struct.* **21**, 231 (1974).
- [4286] Bieri, G., and Heilbronner, E. Der Einfluss von Substituenten in Stellung 4 auf das n-Ionisations-potential des Chinuclidins, *Helv. Chim. Acta* **57**, 546 (1974).
- [4287] Hartmann, O.-R., Lebert, K.-H., and Chun, H.-U. Elektronenstoß- und Ionenstoßuntersuchungen an Schwefeldichlorid und Dischwefeldichlorid, *Z. Phys. Chem. (Frankfurt am Main)* **92**, 311 (1974).
- [4288] Samson, J. A. R., and Petrosky, V. E. Continuum ionization transition probabilities of atomic oxygen, *Phys. Rev. A* **9**, 2449 (1974).
- [4289] Salisbury, K. Quenching of the fluorescence of styrenes by ground state oxygen, *J. Photochem.* **2**, 401 (1973/1974).
- [4290] Schmidt, H., and Schweig, A. Notiz zur transannularen n/ π -Wechselwirkung in 2,5-Dihydrofuran, *Chem. Ber.* **107**, 725 (1974).
- [4291] Bock, H., Wagner, G., Wittel, K., Sauer, J., and Seebach, D. Photoelektronenspektren und Moleküleigenschaften. XXXII. n/ π -Konjugation in heterosubstituierten Äthylenen, *Chem. Ber.* **107**, 1869 (1974).
- [4292] Höhne, G., Marschner, F., and Praefcke, K. Organische Schwefelverbindungen. X. Photoelektronen- und UV-spektroskopische Untersuchung eines nichtkonjugierten 1,3-Oxathiol-Spiroketons, *Z. Naturforsch.* **29b**, 546 (1974).
- [4293] Schäfer, W., Schweig, A., Maier, G., and Sayrac, T. Inductive effect of a carbonyl group. The electronic structure of [5]annulenes, *J. Am. Chem. Soc.* **96**, 279 (1974).
- [4294] Stafast, H., and Bock, H. Photoelektronenspektren und Moleküleigenschaften, XXXIV. Cyanamid, *Chem. Ber.* **107**, 1882 (1974).
- [4295] Bock, H., and Solouki, B. Photoelektronenspektren und Moleküleigenschaften, XXXV. Sulfoxide X_2SO - Beispiele für den Nutzen von Korrelations - diagrammen bei der Diskussion von Substituenteneffekten und von geometrischen Störungen, *Chem. Ber.* **107**, 2299 (1974).
- [4296] Bougeard, D., Schrader, B., Bleckmann, P., and Plesser, T. Ramanspektroskopie und Molekülstruktur. VII. Infrarot-, Raman- und Photoelektronenspektrum des Hexamethyl-Dewarbenzols; Normalkoordinatenberechnung und Untersuchung der π -Elektronen-Wechselwirkung, *Justus Liebigs Ann. Chem.* **156**, 137 (1974).
- [4297] Marschner, F., Jüds, H., and Goetz, H. Zur Homokonjugation im Hexamethyl-Dewar-Benzol, *Tetrahedron Letters*, 3983 (1973).
- [4298] Kroner, J., Nöth, H., and Niedenzu, K. Photoelektronenspektroskopische Untersuchungen an Bor-Verbindungen. III. π -Elektronendelokalisation in 1,3,2-Diazaborolinen, *J. Organometal. Chem.* **71**, 165 (1974).
- [4299] Kroner, J., Nölle, D., Nöth, H., and Winterstein, W. Photoelektronenspektroskopische Untersuchungen an Bor-Verbindungen. IV. Ionisierungsenergien und Geometrie von Tetrazadiborinen, *Z. Naturforsch.* **29b**, 476 (1974).
- [4300] Köppel, C., Schwarz, H., and Bohlmann, F. Energetische Betrachtungen zur intramolekularen Solvatisierung von Ionen bei der elektronenstoßinduzierten Fragmentierung von α,ω -Bis-(Trimethylsilyl)-äthern, *Org. Mass Spectrom.* **9**, 567 (1974).
- [4301] Martin, H.-D., and Schwesinger, R. Notiz über eine beobachtete through-bond-Wechselwirkung über vier σ -Bindungen, *Chem. Ber.* **107**, 3143 (1974).
- [4302] Stefanović, D., and Grützmacher, H. F. The ionisation potential of some substituted pyridines, *Org. Mass Spectrom.* **9**, 1052 (1974).
- [4303] Wittel, K., and Bock, H. Photoelektronenspektren und Moleküleigenschaften. XXVII. Chlor- und Bromäthylene- Beispiele für Änderungen in π - und σ -Systemen, *Chem. Ber.* **107**, 317 (1974).
- [4304] Lauer, G., Müller, C., Schulte, K.-W., Schweig, A., and Krebs, A. Struktur und Spin-Multiplizität eines [4]Annulen-Systems, *Angew. Chem.* **86**, 597 (1974).
- [4305] Dean, C. R. S., Finch, A., Gardner, P. J., and Payling, D. W. Appearance and ionization potentials of ions produced by electron-impact on some phosphorus-fluorine compounds: the phosphorus-phosphorus bond dissociation energy in diphosphorus tetrafluoride, *J. Chem. Soc., Faraday Trans. I* **70**, 1921 (1974).
- [4306] Knowles, D. J., and Nicholson, A. J. C. Ionization energies of formic and acetic acid monomers, *J. Chem. Phys.* **60**, 1180 (1974).
- [4307] Goodman, T. D., Allen, J. D., Jr., Cusachs, L. C., and Schweitzer, G. K. The photoelectron spectra of gaseous alkali halides, *J. Electron Spectrosc. Relat. Phenom.* **3**, 289 (1974).

- [4308] Werner, A. S., Tsai, B. P., and Baer, T. Photoionization study of the ionization potentials and fragmentation paths of the chlorinated methanes and carbon tetrabromide, *J. Chem. Phys.* **60**, 3650 (1974).
- [4309] Cradock, S., and Duncan, W. The photoelectron spectrum of CSe_2 , *Mol. Phys.* **27**, 837 (1974).
- [4310] Wittel, K., Bock, H., and Manne, R. Photoelectron spectra of iodo ethylenes. A simple method to incorporate spin orbit coupling in molecular orbital models, *Tetrahedron* **30**, 651 (1974).
- [4311] Paulus, J.-M., and Abbé, J.-C. Potentiel d'apparition de I_2^{2+} a partir de I_2 , *J. Chim. Phys.*, 690 (1973).
- [4312] Cantú, A. M., Jannitti, E., and Tondello, G. Spectra of N VI, O VII, F VII, and F VIII in grazing- incidence region, *J. Opt. Soc. Am.* **64**, 699 (1974).
- [4313] Bernauer, O., and Weil, K. G. Massenspektrometrische Untersuchungen an Silberhalogeniden. III: Silberbromid und Silberjodid, *Ber. Bunsenges.* **12**, 1339 (1974).
- [4316] Thorstad, O., and Undheim, K. Mass spectrometry of onium compounds. XXIV. Ionisation potential in structure analysis of pyridodiaz-oxides, *Chem. Scr.* **6**, 222 (1974).
- [4317] Thorstad, O., Undheim, K., and Hvistendahl, G. Mass spectrometry of onium compounds. XXIII. Ionisation potentials in the structural assignment of $[\text{M}-\text{N}_2]$ ions from diazo-oxides, *Org. Mass Spectrom.* **9**, 548 (1974).
- [4318] Locht, R., and Schopman, J. The dissociative ionization in oxygen, *Intern. J. Mass Spectrom. Ion Phys.* **15**, 361 (1974).
- [4319] Puttemans, J. P. Ionisation de cycloalcanes (C_3 a C_{12}) en spectroscopie photoelectronique et par impact électronique, *Ing. Chim. (Brussels)* **56**, 64 (1974).
- [4320] Gordon, S. M., Krige, G. J., and Reid, N. W. Isotope effects in the unimolecular decomposition of ethylene by low-energy electron impact, *Intern. J. Mass Spectrom. Ion Phys.* **14**, 109 (1974).
- [4321] Sauvageau, P., Doucet, J., Gilbert, R., and Sandorfy, C. Vacuum ultraviolet and photoelectron spectra of fluoroethanes, *J. Chem. Phys.* **61**, 391 (1974).
- [4322] Fehlner, T. P., and Turner, D. W. The photoelectron spectrum of SiF_2 , *Inorg. Chem.* **13**, 754 (1974).
- [4323] Guimon, C., Gonbeau, D., Pfister-Guillouzo, G., Åsbrink, L., and Sandström, J. Electronic structure of sulphur compounds. VI. Photoelectron spectra of some simple thiocarbonyl compounds, *J. Electron Spectrosc. Relat. Phenom.* **4**, 49 (1974).
- [4324] Müller, C., Schweig, A., and Mock, W. L. Through-conjugation through the sulfone group in 2,5-di-*tert*-butylthiophene 1,1-dioxide, *J. Am. Chem. Soc.* **96**, 280 (1974).
- [4325] Potapov, V. K., Rodionov, A. N., Evlasheva, T. I., and Rogozhin, K. L. Photoionization of triphenyl derivatives of elements in group VB of the periodic table, *Khim. Vys. Energ.* **8**, 559 (1974) [Engl. Transl.: *High Energy Chem. (USSR)* **8**, 486 (1974)].
- [4326] Müller, C., Schweig, A., Anastassiou, A. G., and Wetzel, J. C. Heterohomoconjugation versus heterobicycloconjugation in 9-thiabicyclo[4.2.1]nona- 2,4,7,-triene, *Tetrahedron* **30**, 4089 (1974).
- [4327] Dewar, P. S., Ernstbrunner, E., Gilmore, J. R., Godfrey, M., and Mellor, J. M. Conformational analysis of alkyl aryl ethers and alkyl aryl sulphides by photoelectron spectroscopy, *Tetrahedron* **30**, 2455 (1974).
- [4328] Pykhtina, E. V., Cherednichenko, L. V., Kardash, I. E., Evlasheva, T. I., Sorokin, V. V., Potapov, V. K., and Pravednikov, A. N. Ionization potentials of amines and energies of charge transfer bands in the absorption spectra of complexes of 7,7,8,8-tetracyanoquinodimethan, *Khim. Vys. Energ.* **8**, 307 (1974) [Engl. transl.: *High Energy Chem. (USSR)* **8**, 257 (1974)].
- [4329] Harada, Y., Seki, K., Suzuki, A., and Inokuchi, H. Photoelectron spectrum of vinylcyclopropane, *Chem. Letters*, 893 (1973).
- [4330] Suffolk, R. J. The photoelectron spectra of the perfluorodiazines, *J. Electron Spectrosc. Relat. Phenom.* **3**, 53 (1974).
- [4331] Tajima, S., and Tsuchiya, T. Energetics consideration of C_3H_5^+ ions produced from various precursors by electron impact, *Bull. Chem. Soc. Japan* **46**, 3291 (1973).
- [4332] Wagner, G., Bock, H., Budenz, R., and Seel, F. Photoelektronenspektren und Moleküleigenschaften. XIX. FSSF und SSF₂, *Chem. Ber.* **106**, 1285 (1973).
- [4333] Goetz, H., Marschner, F., and Juds, H. Zur $n-\pi$ Wechselwirkung im Benzanilin, *Tetrahedron* **30**, 1133 (1974).
- [4334] Griebel, R., Hohlneicher, G., and Dörr, F. A photoelectron spectroscopic study of benzonitrile, ethynylbenzene and some of its substituted derivatives, *J. Electron Spectrosc. Relat. Phenom.* **4**, 185 (1974).
- [4335] Heller, R., Varmuza, K., and Krenmayr, P. Massenspektrometrische Untersuchung des Substituenteneffektes bei einfach substituierten Benzophenonen, *Monatsh. Chem.* **105**, 787 (1974).
- [4336] Köppel, C., Schwarz, H., and Bohlmann, F. Elektronenstoßinduzierte Fragmentierung von Acetylenverbindungen. VIII. Struktur der stabilen und instabilen Ionen $[\text{C}_6\text{H}_6]^+$ aus isomeren C_6H_{10} -Kohlenwasserstoffen, *Org. Mass Spectrom.* **8**, 25 (1974).
- [4337] Kuschel, H., and Grützmacher, H.-F. Zum Mechanismus massenspektrometrischer Fragmentierungsreaktionen. XIII. Einfluß der Dissoziationsenergie auf intramolekulare aromatische Substitutionen in den Molekül- Ionen von *N,N*-Dimethyl-*N'*-phenylformamidinen, *Org. Mass Spectrom.* **9**, 408 (1974).
- [4338] Martin, H.-D., Heller, C., and Werp, J. Bishomofulvenkonjugation. Photoelektronenspektren und Elektronenstruktur homologer Quadricyclane, *Chem. Ber.* **107**, 1393 (1974).
- [4339] Preiss, H. Die Massenspektren einiger Arsen- und Arsenigsäureester. Kinetische Untersuchung ihres Fragmentierungsverhaltens, *Z. Anorg. Allg. Chem.* **404**, 175 (1974).
- [4340] Marschner, F., and Goetz, H. Korrelation zwischen Photoelektronen- und Elektronen-Spektren. III. Eine Methode zur Deutung der PE- und UV-Spektren vom Toluol, *Tetrahedron* **30**, 3451 (1974).
- [4341] Marschner, F., and Goetz, H. Korrelation zwischen Photoelektronen- und Elektronen-Spektren. II. Untersuchung aromatischer π -Systeme mit modifizierten PPP-SCF-CI-Parametern, *Tetrahedron* **30**, 3159 (1974).
- [4342] Foster, M. S., Williamson, A. D., and Beauchamp, J. L. Photoionization mass spectrometry of trans-azomethane, *Inter. J. Mass Spectrom. Ion Phys.* **15**, 429 (1974).
- [4343] Terwilliger, D. T., and Smith, A. L. Analysis of autoionizing Rydberg states in the vacuum ultraviolet absorption spectrum of HBr and DBr, *J. Mol. Spectrosc.* **50**, 30 (1974).
- [4344] Potts, A. W., Williams, T. A., and Price, W. C. Photoelectron spectra and electronic structure of diatomic alkali halides, *Proc. Roy. Soc. (London) A* **341**, 147 (1974).
- [4345] Bock, H., Wittel, K., and Haas, A. Photoelektronenspektren und Moleküleigenschaften. XLI. Vergleich von F_3CS -, Cl- und F-Substituenten in Thiocarbonyl- Verbindungen, *Z. Anorg. Allg. Chem.* **408**, 107 (1974).
- [4346] Bohlmann, F., Herrmann, R., Mathar, W., and Schwarz, H. Massenspektrometrische Untersuchung von Amidinen. VII. Intramolekulare Weshselwirkungen bifunktioneller Gruppen bei der elektronenstoßinduzierten Fragmentierung von Piperididen und Piperideiden, *Chem. Ber.* **107**, 1081 (1974).
- [4347] Bruckmann, P., and Klessinger, M. Photoelektronenspektren

- organischer Verbindungen. V. Wechselwirkung kleiner Ringe mit π -Systemen, *Chem. Ber.* **107**, 1108 (1974).
- [4348] Chinone, A., and Ohta, M. Charge-transfer complex of syndones, *Bull. Chem. Soc. Japan* **47**, 1032 (1974).
- [4349] Parr, G. R., and Taylor, J. W. Photoionization mass spectrometry. IV. Carbon dioxide, *Intern. J. Mass Spectrom. Ion Phys.* **14**, 467 (1974).
- [4350] Kräβig, R., Reinke, D., and Baumgärtel, H. Photoreaktionen kleiner organischer Moleküle II. Die Photoionenspektren der Isomeren Propylen-Cyclopropan und Acetaldehyd-Äthylenoxyd, *Ber. Bunsenges.* **78**, 425 (1974).
- [4351] Bergmark, T., Karlsson, L., Jadry, R., Mattsson, L., Albridge, R. G., and Siegbahn, K. Isotopic effects in the electron spectra of $H_2^{16}O$, $H_2^{18}O$, and $D_2^{16}O$, *J. Electron Spectrosc. Relat. Phenom.* **4**, 85 (1974).
- [4352] Nygaard, K. J., and Hahn, Y. B. Ion fluorescence in cesium, *Physica* **75**, 333 (1974).
- [4353] Timoshenko, M. M., and Akopyan, M. E. Photoelectron spectra of cesium halides, *Khim. Vys. Energ.* **8**, 211 (1974) [Engl. transl.: *High Energy Chem. (USSR)* **8**, 175 (1974)].
- [4355] Dehmer, P. M., Berkowitz, J., and Chupka, W. A. Photoionization of atomic nitrogen, *J. Chem. Phys.* **60**, 2676 (1974).
- [4356] Coppens, P., Smets, J., Fishel, M. G., and Drowart, J. Mass spectrometric study of the photoionization of nitrous oxide in the wavelength interval 1000–600 Å, *Intern. J. Mass Spectrom. Ion Phys.* **14**, 57 (1974).
- [4357] Houk, K. N., George, J. K., and Duke, Jr., R. E. A frontier molecular orbital treatment of fulvene cycloadditions. Molecular orbital calculations and photoelectron spectra of substituted fulvenes, *Tetrahedron* **30**, 523 (1974).
- [4358] Krenmayr, P., Heller, R., and Varmuza, K. Massenspektrometrische Untersuchungen an Benzophenon und substituierten Benzophenonen. I. Ermittlung thermodynamischer Größen, *Organic Mass Spectrom.* **9**, 998 (1974).
- [4359] Kuschel, H., and Grützmacher, H.-F. Zum Mechanismus massenspektrometrischer Fragmentierungsreaktionen. XI. Einfluß von Substituenten auf die Bildung cyclischer Fragment-Ionen in den Massenspektren von *N,N*-Dimethyl-*N'*-2-chlorphenylformamidinen und 2-Chlorformaniliden, *Org. Mass Spectrom.* **9**, 395 (1974).
- [4360] Leduc, G., and Rousseau, Y. Spectrometrie de masse d'imines aliphatiques, *Can. J. Chem.* **52**, 1648 (1974).
- [4361] Schäfer, W., Schweig, A., Maier, G., Sayrac, T., and Crandall, J. K. Electronic structure of cyclopropanone, *Tetrahedron Letters*, 1213 (1974).
- [4362] Schmidt, H., Schweig, A., and Krebs, A. Splitting of the degenerate acetylenic π MOs; a probe for ring strain, *Tetrahedron Letters*, 1471 (1974).
- [4363] Schäfer, W., Schmidt, H., Schweig, A., Hoffmann, R. W., and Kurz, H. Evidence for strong nonbonded n/π interaction in bicyclo[4.2.1]nona-2,4,7-trien-9-one, *Tetrahedron Letters*, 1953 (1974).
- [4364] Streets, D. G., and Williams, T. A. Photoelectron spectroscopy of 9,10-dihaloanthracenes, *J. Electron Spectrosc. Relat. Phenom.* **3**, 71 (1974).
- [4365] Chau, F. T., and McDowell, C. A. Photoelectron spectra of fluorotribromomethane and fluorotrichloromethane, *J. Electron Spectrosc. Relat. Phenom.* **6**, 357 (1975).
- [4366] Doucet, J., Sauvageau, P., and Sandorfy, C. Photoelectron and far-ultraviolet absorption spectra of chlorofluoro derivatives of ethane, *J. Chem. Phys.* **62**, 355 (1975).
- [4367] Chau, F. T., and McDowell, C. A. Photoelectron spectra of 1,2-dichloro-, 1,2-dibromo- and 1,2-diiodo-ethane, *J. Electron Spectrosc. Relat. Phenom.* **6**, 365 (1975).
- [4368] Distefano, G., Pignataro, S., Szepes, L., and Borossay, J. Photoelectron spectroscopy study of the triphenyl derivatives of the group V elements, *J. Organometal. Chem.* **102**, 313 (1975).
- [4369] Buttrill, S. E. Jr., Williamson, A. D., and LeBreton, P. Photoionization measurement of the heat of formation of allyl cations, *J. Chem. Phys.* **62**, 1586 (1975).
- [4370] J. M., Golob, L., Jonathan, N., and Morris, A. Vacuum ultraviolet photoelectron spectroscopy of transient species, *J. Chem. Soc. Faraday Trans. II* **71**, 1026 (1975).
- [4371] Cowley, A. H., Dewar, M. J. S., and Goodman, D. W. Molecular photoelectron spectroscopic studies of some trifluoromethyl-substituted phosphines and chlorophosphines, *J. Am. Chem. Soc.* **97**, 3653 (1975).
- [4372] Guest, M. F., Higginson, B. R., Lloyd, D. R., and Hillier, I. H. Interpretation of the valence photoelectron spectra of $Mn(CO)_5H$, $Mn(CO)_4CH_3$ and $Fe(CO)_5H_2$, *J. Chem. Soc. Faraday Trans. II*, **71**, 902 (1975).
- [4373] Cradock, S., Ebsworth, E. A. V., Moretto, H., and Rankin, D. W. H. Photoelectron spectra and fluxional behaviour in some σ -cyclopentadienes, *J. Chem. Soc. Dalton Trans.* 390, (1975).
- [4374] Brogli, F., Heilbronner, E., Wirz, J., Kloster-Jensen, E., Bergman, R. G., Vollhardt, K. P. C., and Ashe III, A. J. The consequences of σ and π conjugative interactions in mono-, di- and triacetylenes. A photoelectron spectroscopic investigation, *Helv. Chim. Acta* **58**, 2620 (1975).
- [4375] Condorelli, G., Fragalà, I., Centineo, A., and Tondello, E. The electronic structure and photoelectron spectra of dichlorodi- π -cyclopentadienyl- titanium(IV),- zirconium(IV) and-hafnium(IV), *J. of Organomet. Chem.* **87**, 311 (1975).
- [4376] Baerends, E. J., Oudshoorn, Ch., and Oskam, A. Photoelectron spectra and X α calculations of iron pentacarbonyl and ethyleneiron tetracarbonyl, *J. Electron Spectrosc. Relat. Phenom.* **6**, 259 (1975).
- [4377] Distefano, G., Mazzucato, U., Modelli, A., Pignataro, S., and Orlandi, G. Photoelectron (He I) spectroscopic study of styrylpyridines, *J. Chem. Soc. Faraday Trans. II* **71**, 1583 (1975).
- [4378] Arnold, D. E. J., and Rankin, D. W. H. Preparation and properties of bis(difluorophosphino)- and tris(difluorophosphino)-amine, *J. Chem. Soc. Dalton Trans.* 889 (1975).
- [4379] Bergmann, H., and Bock, H. Photoelectron spectra and molecular properties, XLVI nitroso compounds - electron-rich molecules, *Z. Naturforsch.* **30b**, 629 (1975).
- [4380] Astrup, E. E., Bock, H., Wittel, K., and Heimbach, P. Photoelectron spectra and molecular properties. LIII. Methyl-substituent effects on the hexatriene π system, *Acta Chem. Scand. Ser. A* **29**, 827 (1975).
- [4381] Brehm, B., and Höfler, K. The 21.22-eV photoelectron spectrum of barium, *Intern. J. Mass Spectrom. Ion Phys.* **17**, 371 (1975).
- [4382] Aloisi, G., Santini, S., and Savelli, G. Molecular complexes of heteroaromatic five membered ring compounds with tetracyanoethylene. Charge transfer spectra, equilibrium constants and ionization potentials of the donors, *J. Chem. Soc. Faraday Trans. I* **70**, 2045 (1975).
- [4383] Cradock, S., and Duncan, W. Photoelectron spectra of OCSe and SCSe, *J. Chem. Soc. Faraday Trans. II* **6**, 1262 (1975).
- [4384] Brittain, H. G., and Disch, R. L. The He(I) photoelectron spectra of some bivalent transition metal β -diketonate complexes* *J. Electron Spectrosc. Relat. Phenom.* **7**, 475 (1975).
- [4385] Asmus, P., Klessinger, M., Meyer, L.-U., and deMeijere, A. Conjugative interaction between cyclopropyl walsh orbitals and π -orbitals in dispiro[2.2.2]deca-4,9-diene, *Tetrahedron Letters* **6**, 381 (1975).

- [4386] Bernardi, F., Colonna, F. P., Dembech, P., Distefano, G., and Vivarelli, P. Through space and through bond interactions in [2.2] metacyclo-2,6- pyridinophane studied by ultraviolet photoelectron spectroscopy, *Chem. Phys. Letters* **36**, 539 (1975).
- [4387] Bischof, P., Gleiter, R., and Hofmann, P. 229. Photoelectron spectra of vicinal tricarbonyls, *Helv. Chim. Acta* **58**, 2130 (1975).
- [4388] DeKock, R. L., and Lloyd, D. R. The He I photoelectron spectrum of sulphur trioxide, *J. Chem. Soc. Dalton Trans.* 526 (1973).
- [4389] Bernardi, F., Distefano, G., Mangini, A., Pignataro, S., and Spunta, G. Photoelectron spectra of substituted anisoles and thioanisoles, *J. Electron Spectrosc. Relat. Phenom.* **7**, 457 (1975).
- [4390] Bally, T., and Haselbach, E. The photoelectron spectrum of triisopropylidenecyclopropane ('Hexamethyl-3-radialene'), *Helv. Chim. Acta* **58**, 321 (1975).
- [4391] Allan, M., Heilbronner, E., and Kloster-Jensen, E. A photoelectron-spectroscopic investigation of benzologue tropones, *J. Electron Spectrosc. Relat. Phenom.* **6**, 181 (1975).
- [4392] Bak, B., Jansen, P., and Stafast, H. Cyanogen azide: ionisation potentials and *ab initio* SCF MO calculation, *Chem. Phys. Letters* **35**, 247 (1975).
- [4393] Anthony, M. T., Green, M. L. H., and Young, D. Preparation of zerovalent di(η -arene)titanium compounds using titanium vapour, *J. Chem. Soc. Dalton Trans.* 1419 (1975).
- [4394] Bieri, G., Heilbronner, E., Goldstein, M. J., Leight, R. S., and Lipton, M. S. The photoelectron spectrum of dewar benzene, *Tetrahedron Letters* **8**, 581 (1975).
- [4395] Brown, R. S. A photoelectron investigation of acyl silanes: The photoelectron spectra of trimethylsilyl phenyl ketone and phenyl *tert*-butyl ketone, *Can. J. Chem.* **53**, 2446 (1975).
- [4396] Batich, C. Photoelectron spectroscopy of bis(π -allyl) nickel and its methyl substituted derivatives: support for the near validity of Koopmans' Theorem, *J. Am. Chem. Soc.* **98**, 7585 (1976).
- [4397] Bischof, P., Gleiter, R., Hopf, H., and Lenich, F. T., Photoelectron spectra of open chain C_6H_6 isomers, *J. Am. Chem. Soc.* **97**, 5467 (1975).
- [4398] Barker, G. K., Lappert, M. F., Pedley, J. B., Sharp, G. J., and Westwood, N. P. C. Bonding studies of boron and the group 3-5 elements. Part XV. He(I) photoelectron spectra of monomeric group 3 trihalide, trimethyl, and mixed halogenomethyl species, *J. Chem. Soc. Dalton Trans.* 1765 (1975).
- [4399] Brown, R. S. Photoelectron studies on intramolecularly hydrogen-bonded systems. I. The photoelectron spectra of *cis*- and *trans*-2-amino- cyclopentanol, and *cis*- and *trans*-2-(*N,N*-dimethylamino) cyclopentanol, *Can. J. Chem.* **54**, 642 (1976).
- [4400] Bischof, P., Gleiter, R., and Müller, E. The electronic structure of benzvalene, *Tetrahedron* **32**, 2769 (1976).
- [4401] Egdell, R., Green, J. C., and Rao, C. N. R. Photoelectron spectra of substituted benzenes, *Chem. Phys. Letters* **33**, 600 (1975).
- [4402] Guimon, M. F., Guimon, C., Metras, F., and Pfister-Guillouzo, G. Application of photoelectron spectroscopy to conformational analysis of *S*- tetrathianes, *J. Am. Chem. Soc.* **98**, 2078 (1976).
- [4403] Gonbeau, D., Guimon, C., Deschamps, J., and Pfister-Guillouzo, G. Electronic structure of sulphur compounds IX. Photoelectron spectra of various 1,2-dithiole-3-thiones, *J. Electron Spectrosc. Relat. Phenom.* **6**, 99 (1975).
- [4404] Frost, D. C., Lee, S. T., McDowell, C. A., and Westwood, N. P. C. Photoelectron spectroscopic studies of some nitrosyl and nitril halides and nitric acid, *J. Electron Spectrosc. Relat. Phenom.* **7**, 331 (1975).
- [4405] Guimon, C., Guimon, M.-F., and Pfister-Guillouzo, G. Application of photoelectron spectroscopy to conformational analysis of two 1,3-dithia compounds, *Tetrahedron Letters* **17**, 1413 (1975).
- [4406] Gleiter, R., Gygax, R., and Reid, D. H. The He 584Å photoelectron spectra of analogs of thiathiophene, *Helv. Chim. Acta* **58**, 1591 (1975).
- [4407] Guimon, C., and Pfister-Guillouzo, G. Electronic structure of sulfur compounds XVI. Photoelectron spectra of ethylene trithiocarbonate and ethylene dithiocarbonate, *J. Electron Spectrosc. Relat. Phenom.* **7**, 191 (1975).
- [4408] Frost, D. C., Lee, S. T., McDowell, C. A., and Westwood, N. P. C. The photoelectron spectrum of diazene (diimine), *Chem. Phys. Letters* **30**, 26 (1975).
- [4409] Cradock, S., Ebsworth, E. A. V., Meikle, G. D., and Rankin, D. W. H. Preparation, properties, and molecular structure of silylsulphinylamine, *J. Chem. Soc. Dalton Trans.* 805 (1975).
- [4410] Guimon, M.-F., Guimon, C., and Pfister-Guillouzo, G. Application of photoelectron spectroscopy to conformational analysis of 1,2,4-trithiolanes, *Tetrahedron Letters* **7**, 441 (1975).
- [4411] Richardson, N. V., and Weinberger, P. The electronic structure of the S_8 molecule, *J. Electron Spectrosc. Relat. Phenom.* **6**, 109 (1975).
- [4412] Hall, M. B., Hillier, I. H., Connor, J. A., Guest, M. F., and Lloyd, D. R. The electronic structure of transition metal complexes containing organic ligands III. Low energy photoelectron spectra and *ab initio* SCF MO calculations of iron tricarbonyl cyclobutadiene, *Mol. Phys.* **30**, 839 (1975).
- [4413] Cradock, S., Ebsworth, E. A. V., and Muir, I. B. Photoelectron spectra and bonding of (N-B) -2,8,9-trioxa-5-aza-1-bora-bicyclo[3.3.3]undecane (boratran) and some 2,8,9-trioxa-5-aza-1-sila-bicyclo[3.3.3]undecanes (silatrans), *J. Chem. Soc. Dalton Trans.* 25 (1975).
- [4414] Delwiche, J. P., and Praet, M. Th. Spectre de photoélectrons He(I) de l'hexafluorobicyclo-[2.2.0]- hexadiène-2,5, J. Electron Spectrosc. Relat. Phenom. **7**, 317 (1975).
- [4415] Banna, M. S., and Shirley, D. A. Molecular photoelectron spectroscopy at 132.3 eV: N_2 , CO, C_2H_4 and O_2 , *J. Electron Spectrosc. Relat. Phenom.* **8**, 255 (1976).
- [4416] Bastide, J., Heilbronner, E., Maier, J. P., and Ashe III, A. J. The photoelectron spectrum of bismabenzene, *Tetrahedron Letters* **6**, 411 (1976).
- [4417] Bock, H., Haselbach, E., Maier, E., and Stafast, H. The photoelectron spectrum of tetracyanomethane, *Helv. Chim. Acta* **59**, 1035 (1976).
- [4418] Baker, A. D., Brisk, M. A., Venzani, T. J., Kwon, Y. S., and Sadka, S. Spiroconjugation involving sulfur 3p atomic orbitals, *Tetrahedron Letters* **38**, 3415 (1976).
- [4419] Alder, R. W., Goode, N. C., King, T. J., Mellor, J. M., and Miller, B. W. A 1,5-Diazabicyclo[3.3.3] undecane derivative with almost planar bridgehead nitrogens, *J. Chem. Soc. Chem. Commun.* 173, (1976).
- [4420] Alderdice, D. S., and Dixon, R. N. Photoelectron spectra of nitrosyl halides, *J. Chem. Soc. Faraday Trans. II* **73**, 245 (1977).
- [4421] Bally, T., Haselbach, E., Lanyiova, S., Marschner, F., and Rossi, M. Concerning the conformation of isolated benzylideneaniline, *Helv. Chim. Acta* **59**, 486 (1976).
- [4422] Abbas, M. I., Dyke, J. M., and Morris, A. Photoelectron spectrum of nitrosyl chloride, *J. Chem. Soc. Faraday Trans II* **72**, 814 (1976).
- [4423] Schmidt, H., Schweig, A., Mathey, F., and Müller, G. Molecular conformation and hyperconjugation. P-C-hyperconjugation and the conformation of vinyl-, allyl-,

- phenyl- and benzylphosphines, *Tetrahedron*, **31**, 1287 (1975).
- [4424] Hardin, A. H., and Sandorfy, C. Photoelectron and vacuum ultraviolet spectra of a series of fluoroethers, *J. of Fluorine Chem.* **5**, 435 (1975).
- [4425] Green, J. C., Jackson, S. E., and Higginson, B. Photoelectron studies of some bent bis(η -cyclopentadienyl)metal complexes. Part I. Some eighteen- electron systems with hydride, alkyl, olefin, allyl, and carbonyl ligands, *J. Chem. Soc. Dalton Trans.* 403 (1975).
- [4426] Green, J. C., and Hayes, A. J. Ionization energies of an Mo-Mo quadruple bond; a He(I) photoelectron study of some molybdenum-dicarboxylate dimers, *Chem. Phys. Letters* **31**, 306 (1975).
- [4427] Flamini, A., Semprini, E., and Condorelli, G. Electronic structure of donor groups by photoelectron spectroscopy: thioderivatives of the carboxylate group, *Chem. Phys. Letters* **32**, 365 (1975).
- [4428] Groenenboom, C. J., de Liefde Meijer, H. J., Jellinek, F., and Oskam, A. UV photoelectron spectra of (cyclopentadienyl)-(cycloheptatrienyl)- zirconium-, niobium and-molybdenum, *J. Organometal. Chem.* **97**, 73 (1975).
- [4429] Houk, K. N., Chang, Y.-M., and Engel, P. S. Photoelectron spectroscopy of azo compounds, *J. Am. Chem. Soc.* **97**, 1824 (1975).
- [4430] Hush, N. S., Cheung, A. S., and Hilton, P. R. Binding energies of π - and "lone-pair"-levels in mono- and diaza-phenanthrenes and anthracenes: an He(I) photoelectron spectroscopic study, *J. Electron Spectrosc. Relat. Phenom.* **7**, 385 (1975).
- [4431] Levenson, R. A., Cihonski, J. L., Milazzo, P., and Ceasar, G. P. Photoelectron spectra of $\text{Fe}(\text{CO})_2\text{X}_2$ ($\text{X}=\text{Br}, \text{I}$). Transition metal analogs of the methylene halides, *Inorg. Chem.* **14**, 2578 (1975).
- [4432] Kroner, J., Wiberg, N., and Bayer, H. Photoelektronenspektrum von tetrazen, *Angew. Chem.* **87**, 203 (1975).
- [4433] Asmus, P., and Klessinger, M. Photoelektronenspektren organischer Verbindungen, IX. Sterisch fixierte Bicyclopentyl, *Liebigs. Ann. Chem.* **12**, 2169 (1975).
- [4434] Klessinger, M., Asmus, P., and Kraatz, U. Photoelektronenspektren organischer Verbindungen-VII, *Tetrahedron* **31**, 517 (1975).
- [4435] Muller, J.-F. 287. Spectres photoélectroniques He(I) et He(II) du benzo[*b*]sélénophène et du benzo[*b*]tellurophène, *Helv. Chim. Acta* **58**, 2646 (1975).
- [4436] Hildenbrand, D. L. Thermochemistry of molecular FeO , FeO^+ and FeO_2 , *Chem. Phys. Letters* **34**, 352 (1975).
- [4437] Salmons, G., Faure, R., and Vincent, E.-J. Structure électronique en série benzothiazolique: Spectres photoélectroniques et calculs C.N.D.O., *C. R. Acad. Sci. Paris* **280**, 605 (1975).
- [4438] Limouzin, Y., and Maire, J. C. Spectres photoélectroniques des composés organométalliques, *J. Organometal. Chem.* **92**, 169 (1975).
- [4439] Guimon, C., Pfister-Guillouzo, G., and Arbelot, M. Spectres photoélectroniques d'hétérocycles carbonyles et thiocarbonyles, *Tetrahedron* **31**, 2769 (1975).
- [4445] Hush, N. S., and Cheung, A. S. Ionization potentials and donor properties of nucleic acid bases and related compounds, *Chem. Phys. Letters* **34**, 11 (1975).
- [4446] Fehlner, T. P. Photoelectron spectroscopy of *closocarboranes*. Observation of exo-polyhedral molecular orbitals, *Inorg. Chem.* **14**, 934 (1975).
- [4447] Guest, M. F., Hillier, I. H., Higginson, B. R., and Lloyd, D. R. The electronic structure of transition metal complexes containing organic ligands II. Low energy photoelectron spectra and *ab initio* SCF MO calculations of dibenzene chromium and benzene chromium tricarbonyl, *Mol. Phys.* **29**, 113 (1975).
- [4448] Hall, M. B. The use of spin-orbit coupling in the interpretation of photoelectron spectra. I. Application to substituted rhenium pentacarbonyls, *J. Am. Chem. Soc.* **97**, 2057 (1975).
- [4449] Boyd, R. J., Bünzli, J.-C. G., and Snyder, J. P. Photoelectron spectra of diazabasketene, diazadelacyclene, and related polycyclic *cis*- azoalkanes, *J. Am. Chem. Soc.* **98**, 2398 (1976).
- [4450] Brown, R. S. Application of photoelectron spectroscopy to intramolecularly hydrogen-bonded systems. Part III. The photoelectron spectra of *cis* and *trans* 2-substituted cyclopentanols and *cis* and *trans* 2-substituted cyclohexanols, *Can J. Chem.* **54**, 1929 (1976).
- [4451] Kobayashi, T. Photoelectron spectra of *N,N*-dimethylnitrosamine and related compounds, *Z. Phys. Chem. N. Folge* **97**, 269 (1975).
- [4452] Colonna, F. P., Distefano, G., Pignataro, S., Pitacco, G., and Valentin, E. Ionization energies of some amines and enamines and an estimation of their relative basicity in gaseous phase, *J. Chem. Soc., Faraday Trans. II* **71**, 1572 (1975).
- [4453] Bieri, G., Heilbronner, E., Kobayashi, T., Schmelzer, A., Goldstein, M. J., Leight, R. S., and Lipton, M. S. 286. Dewar benzene and some of its derivatives. A photoelectron spectroscopic analysis, *Helv. Chim. Acta* **59**, 2657 (1976).
- [4454] Lloyd, D. R., Lynaugh, N., Roberts, P. J., and Guest, M. F. Photoelectron studies of boron compounds, Part 5. - Higher boron hydrides B_4H_{10} , B_5H_{10} and $\text{B}_{10}\text{H}_{12}$, *J. Chem. Soc. Faraday Trans. II* **71**, 1382 (1975).
- [4455] Lee, T. H., and Rabalais, J. W. Photoelectron spectrum and ground state electronic structure of chromyl chloride vapor, *Chem. Phys. Letters* **34**, 135 (1975).
- [4456] Head, R. A., Nixon, J. F., Sharp, G. J., and Clark, R. J. Photoelectron spectroscopic study of metal trifluorophosphine and hydridotrifluorophosphine complexes, *J. Chem. Soc. Dalton Trans.* 2054 (1975).
- [4457] Hosomi, A., and Traylor, T. G. Studies of interactions of adjacent carbon-metal σ bonds by photoelectron spectroscopy, *J. Am. Chem. Soc.* **97**, 3682 (1975).
- [4458] Hilpert, K., Naoumidis, A., and Wolff, G. Mass spectrometric study of the evaporation of BaAl_2O_4 , *High Temp. Sci.* **7**, 1 (1975).
- [4459] Mollere, P. D., Houk, K. N., Bomse, D. S., and Morton, T. H. Photoelectron spectra of sterically congested alkenes and dienes, *J. Am. Chem. Soc.* **98**, 4732 (1976).
- [4460] Allan, M., Heilbronner, E., Kloster-Jensen, E., and Maier, J. P. The π -states of tetraacetylene radical cation, *Chem. Phys. Letters* **41**, 228 (1976).
- [4461] Spanget-Larsen, J., Gleiter, R., and Hünig, S. The electronic structure of dibenzotetrathiafulvalene, *Chem. Phys. Letters* **37**, 29 (1976).
- [4462] Meeks, J. L., and McGlynn, S. P. Photoelectron spectra of carbonyls. Oxamide, parabanic acid, and their *N*-methyl derivatives, *J. Am. Chem. Soc.* **97**, 5079 (1975).
- [4463] Kobayashi, T. Photoelectron spectra of *p*-benzoquinones, *J. Electron Spectrosc. Relat. Phenom.* **7**, 349 (1975).
- [4464] Kobayashi, T., Yokota, K., and Nagakura, S. Photoelectron spectra of the *cis*- and *trans*-isomers of some ethylene derivatives, *Bull. Chem. Soc. Japan* **48**, 412 (1975).
- [4465] Egdel, R., Green, J. C., Rao, C. N. R., Gowenlock, B. G., and Pfaff, J. He(I) photoelectron studies of *C*-nitroso compounds, *J. Chem. Soc. Faraday Trans. II*, 988 (1975).
- [4466] Utsunomiya, C., Kobayashi, T., and Nagakura, S. Photoelectron spectra of substituted naphthalenes, *Bull. Chem. Soc. Japan* **48**, 1852 (1975).
- [4467] Rao, C. N. R. Lone-pair ionization bands of chromophores in the photoelectron spectra of organic molecules, *Indian J. Chem.* **13**, 950 (1975).
- [4468] Neijzen, B. J. M., Schmitz, R. F., Klumpp, G. W., and

- DeLange, C. A. $n-\pi$ Interactions in homoallylic methyl ethers. A photoelectron spectroscopic study, *Tetrahedron* **31**, 873 (1975).
- [4469] Mines, G. W., and Thompson, H. W. The photoelectron spectra of amides, thioamides, ureas and thioureas, *Spectrochim. Acta* **31A**, 137 (1975).
- [4470] Maier, J. P., Muller, J.-F., and Kubota, T. Ionisation energies and the electronic structures of the N-oxides of diazabenzenes, *Helv. Chim. Acta* **58**, 1634 (1975).
- [4471] Meeks, J. L., Arnett, J. F., Larson, D., and McGlynn, S. P. Photoelectron spectroscopy of carbonyls. Ionization assignments, *Chem. Phys. Letters* **30**, 190 (1975).
- [4472] Kobayashi, T., and Nagakura, S. Angular distribution for the photoelectron spectra of benzene and hexafluorobenzene, *J. Electron Spectrosc. Relat. Phenom.* **7**, 187 (1975).
- [4473] Kobayashi, T., and Nagakura, S. Photoelectron spectra of nitrophenols and nitroanisoles, *J. Electron Spectrosc. Relat. Phenom.* **6**, 421 (1975).
- [4474] Lappert, M. F., Pedley, J. B., Wilkins, B. T., Stelzer, O., and Unger, E. Bonding studies of compounds of boron and the group 3-5 elements. Part XIII. He(I) photoelectron spectra of phosphines R_nPX_{3-n} ($R=Me$ or Bu ; $X=H, Cl$, or F ; $n=1-3$), $(Me_2N)_nPCl_{3-n}$ ($n=1-3$), and $(R_2N)PF_2$ ($R=Me$ or Et), *J. Chem. Soc. Dalton Trans.* 1207 (1975).
- [4475] Kobayashi, T., Yokota, K., and Nagakura, S. Photoelectron spectra of trans-azobenzene and benzaniline, *J. Electron Spectrosc. Relat. Phenom.* **6**, 167 (1975).
- [4476] Rosmus, P., Stafast, H., and Bock, H. Sulphur dicyanide: Ionisation potentials and Hartree-Fock calculations, *Chem. Phys. Letters* **34**, 275 (1975).
- [4477] Lloyd, D. R., Roberts, P. J., and Hillier, I. H. Electronic structure of nitric acid studied by photoelectron spectroscopy and molecular orbital calculation, *J. Chem. Soc. Faraday Trans. II* **71**, 496 (1975).
- [4478] Hino, S., Seki, K., and Inokuchi, H. Photoelectron spectra of *p*-terphenyl in gaseous and solid states, *Chem. Phys. Letters* **36**, 335 (1975).
- [4479] Schweig, A., and Thon, N. Measurement of relative conformational stabilities by variable temperature photoelectron spectroscopy. A study of rotational isomerism in thioanisole, *Chem. Phys. Letters* **38**, 482 (1976).
- [4480] Aue, D. H., Webb, H. M., and Bowers, M. T. Quantitative proton affinities, ionization potentials, and hydrogen affinities of alkylamines, *J. Am. Chem. Soc.* **98**, 311 (1976).
- [4481] Gleiter, R., Kobayashi, M., Spanget-Larsen, J., Ferraris, J. P., Bloch, A. N., Bechgaard, K., and Cowan, D. O. Photoelectron and electronic absorption spectra of tetrathiafulvalene and related compounds, *Ber. Bunsenges.* **79**, 1218 (1975).
- [4482] Gounelle, Y., Menard, C., Pechine, J. M., Solgadi, D., Menes, F., and Botter, R. Conformational effects on ionization potentials; Photoelectron spectra of dibromo- and bromofluoro- alkyl compounds, *J. Electron Spectrosc. Relat. Phenom.* **7**, 247 (1975).
- [4483] Murad, E., and Hildenbrand, D. L. Thermochemical properties of gaseous ZrO and ZrO_2 , *J. Chem. Phys.* **63**, 1133 (1975).
- [4484] Peel, J. B., and Willett, G. D. Photoelectron spectroscopic studies of the higher alcohols, *Aust. J. Chem.* **28**, 2357 (1975).
- [4485] Alderdice, D. S., and Dixon, R. N. Photoelectron spectrum of sulphur trioxide, *J. Chem. Soc. Faraday Trans II* **72**, 372 (1976).
- [4486] Smoes, S., Drowart, J., and Welter, J. M. Thermodynamic study of the vaporization of europium monosulfide by Knudsen-cell mass spectrometry. Atomization energies of $EuS(g)$, $Eu_2S(g)$, $EuS_2(g)$, $Eu_2O(g)$, $Eu_2O_2(g)$, $Eu_2OS(g)$, and $Eu_2S_2(g)$, *J. Chem. Thermodyn.* **9**, 275 (1977).
- [4487] Meeks, J. L., Arnett, J. F., Larson, D. B., and McGlynn, S. P. Photoelectron spectroscopy of carbonyls. Urea, oxamide, oxalic acid and oxamic acid, *J. Am. Chem. Soc.* **97**, 3905 (1975).
- [4488] Obenland, S., and Schmidt, W. Photoelectron spectra of polynuclear aromatics. IV. The helicenes, *J. Am. Chem. Soc.* **97**, 6633 (1975).
- [4489] Peel, J. B., and Willett, G. D. Photoelectron spectrum of methylenimine by spectrum stripping, *J. Chem. Soc., Faraday Trans. II* **71**, 1799 (1975).
- [4490] Schmidt, H., Schweig, A., and Manuel, G. Vapourphase conformation of benzylmercuric chloride, *J. Chem. Soc. Chem. Commun.* 667, (1975).
- [4491] Samson, J. A. R., and Gardner, J. L. On the ionization potential of molecular oxygen, *Can. J. Phys.* **53**, 1948 (1975).
- [4492] Higginson, B. R., Lloyd, D. R., Evans, S., and Orchard, A. F. Photoelectron studies of metal carbonyls. Part 5. - Substituted group VIIA carbonyls, *J. Chem. Soc. Faraday Trans. II* **71**, 1913 (1975).
- [4493] Runge, W., Kosbahn, W., and Kroner, J. The molecular structure of allenes and ketenes II [1] Photoelectron spectra, absorption spectra, and CNDO/S-calculations of phenyl and methyl substituted allenes, *Ber. Bunsenges.* **79**, 371 (1975).
- [4494] Stockbauer, R., and Inghram M. G. Vibrational structure in the ground state of ethylene and ethylene- d_4 molecular ions investigated by threshold photoelectron spectroscopy, *J. Electron Spectrosc. Relat. Phenom.* **7**, 492 (1975).
- [4495] Kobayashi, T., and Nagakura, S. Photoelectron spectra of phenyl isocyanates and phenyl isothiocyanate, *J. Electron Spectrosc. Relat. Phenom.* **7**, 488 (1975).
- [4496] Wittel, K. The photoelectron spectrum of formylfluoride, *J. Electron Spectrosc. Relat. Phenom.* **8**, 245 (1976).
- [4497] Aue, D. H., Webb, H. M., and Bowers, M. T. Photoelectron spectrum and gas-phase basicity of manxine. Evidence for a planar bridgehead nitrogen, *J. Am. Chem. Soc.* **97**, 4136 (1975).
- [4498] Wu, M., and Fehlner, T. P. Photoelectron spectroscopy of unstable species. The PN molecule, *Chem. Phys. Letters* **36**, 114 (1975).
- [4499] Zverev, V. V., Vovna, V. I., Kitaev, Yu. P., and Vilesov, F. I. Photoelectron spectrum and structure of formaldehyde azine, *J. Struct. Chem.* **16**, 947 (1975).
- [4500] Lee, T. H., Colton, R. J., White, M. G., and Rabalais, J. W. Electronic structure of hydrazoic acid and the azide ion from x-ray and ultra- violet electron spectroscopy, *J. Am. Chem. Soc.* **97**, 4845 (1975).
- [4501] Whitesides, T. H., Lichtenberger, D. L., and Budnik, R. A. Bonding in ring whizzers. I. Photoelectron spectra and molecular orbital calculations for $(\eta^5-C_6H_7)Mn(CO)_3$, $(\eta^5-C_7H_7)Mn(CO)_3$, and $(\eta^5-C_7H_7)Mn(CO)_3$, *Inorg. Chem.* **14**, 68 (1975).
- [4503] Johnson, L. P., and Morrison, J. D. Double ionization to low-lying states of the doubly- charged rare gases, *Intern. J. Mass Spectrom. Ion Phys.* **18**, 355 (1975).
- [4504] Arnold, D. E. J., Ebsworth, E. A. V., and Rankin, D. W. H. Preparation and properties of difluoro- (difluorophosphinoamino)borane, *J. Chem. Soc. Dalton*, 823 (1976).
- [4505] Guido, M., and Gigli, G. Mass spectrometric study of the gaseous PrCN molecule, *High Temp. Sci.* **7**, 122 (1975).
- [4506] Farber, M., and Srivastava, R. D. The dissociation energy of barium oxide, *High Temp. Sci.* **7**, 74 (1975).
- [4507] Compennolle, F. Mass spectrum and heat of formation of isocyanic acid. Production of $[HCO]^+$ from discrete electronic state of molecular ion, *Org. Mass Spectrom* **10**, 289 (1975).
- [4508] Müller, C., Schweig, A., and Vermeer, H. Thiirene dioxides. Electronic structure, *J. Am. Chem. Soc.* **97**, 982 (1975).

- [4509] Brown, R. S. Application of photoelectron spectroscopy to intramolecularly hydrogen-bonded systems. Part II. On the $n-\pi^*$ blue shift of carbonyl-containing molecules, *Can. J. Chem.* **54**, 3203 (1976).
- [4510] Koenig, T., Wieleseke, R., Snell, W., and Balle, T. Helium(I) photoelectron spectrum of *p*-quinodimethane, *J. Am. Chem. Soc.* **97**, 3225 (1975).
- [4511] Brown, R. S. Application of photoelectron spectroscopy to intramolecularly hydrogen-bonded systems. Part IV. π -systems; the photoelectron spectra of *syn*- and *anti*-7-norbornenol, *Can. J. Chem.* **54**, 3206 (1976).
- [4512] Wittel, K., Bock, H., Haas, A., and Pflegler, K. H. Photoelectron spectra and molecular properties XLVII. F_3C -substituted mercury compounds, *J. Electron Spectrosc. Relat. Phenom.* **7**, 365 (1975).
- [4513] Kimura, K., Katsumata, S., Yamazaki, T., and Wakabayashi, H. UV photoelectron spectra and sum rule consideration; Out-of-plane orbitals of unsaturated compounds with planar-skeleton structure, *J. Electron Spectrosc. Relat. Phenom.* **6**, 41 (1975).
- [4514] Kimura, K., Katsumata, S., and Osafune, K. Photoelectron spectroscopic study of skew compounds. Methylhydrazine and unsymmetrical dimethylhydrazine, *Bull. Chem. Soc. Japan* **48**, 2736 (1975).
- [4515] Schäfer, W., Schweig, A., Vermeer, H., Bickelhaupt, F., and De Graaf, H. On the nature of the "free electron pair" on phosphorus in aromatic phosphorus compounds: the photoelectron spectrum of 2-phosphanaphthalene, *J. Electron Spectrosc. Relat. Phenom.* **6**, 91 (1975).
- [4516] Lloyd, D. R., Roberts, P. J., Hillier, I. H., and Shenton, I. C. On the photoelectron spectrum of sulphur trioxide, *Mol. Phys.* **31**, 1549 (1976).
- [4517] Bertoti, I., Craddock, S., Ebsworth, E. A. V., and Whiteford, R. A. Photoelectron spectra and transannular interactions in 1-silacyclopent-3-enes, *J. Chem. Soc. Dalton* 937 (1976).
- [4518] Gingerich, K. A., and Miller, F. Thermodynamic study of gaseous sodium-phosphorus-oxygen ternary molecules by high temperature mass spectrometry, *J. Chem. Phys.* **63**, 1211 (1975).
- [4519] Ulman, J. A., and Fehlner, T. P. Substituent effects in cluster species. Photoelectron spectra of 1-, 2-, and μ -substituted pentaborane(9), *J. Am. Chem. Soc.* **98**, 1119 (1976).
- [4520] McGlynn, S. P., and Meeks, J. L. Photoelectron spectra of carbonyls: Acetaldehyde, acetamide, biacetyl, pyruvic acid, methyl pyruvate and pyruvamide, *J. Electron Spectrosc. Relat. Phenom.* **6**, 269 (1975).
- [4521] Vovna, V. I., Vilesov, F. I., and Lopatin, S. N. Photoelectron spectra of hydrazine and some alkyl derivatives, *Opt. Spectrosc.* **38**, 143 (1975).
- [4522] Rothgery, E. F., McGee, H. A. Jr., and Pusatcioglu, S. Aminodifluoroborane, *Inorg. Chem.* **14**, 2236 (1975).
- [4523] Van Den Ham, D. M. W., Beerlage, M., Van Der Meer, D., and Feil, D. Photoelectron spectra of fluorine substituted diazanaphthalenes: "even cases," *J. Electron Spectrosc. Relat. Phenom.* **7**, 33 (1975).
- [4524] Young, V. Y., and Cheng, K. L. The photoelectron spectra of halogen substituted acetones, *J. Chem. Phys.* **65**, 3187 (1976).
- [4525] Fridh, C., and Åsbrink, L. Photoelectron and electron impact spectrum of HCN, *J. Electron Spectrosc. Relat. Phenom.* **7**, 119 (1975).
- [4526] Kroner, J., Nölle, D., Nöth, H., and Winterstein, W. Photoelektronenspektroskopische Untersuchungen an Bor-Verbindungen, II Fünfgliedrige Heterocyclen des Bors, *Chem. Ber.* **108**, 3807 (1975).
- [4527] Aue, D. H., Webb, H. M., and Bowers, M. T. Proton affinities, ionization potentials, and hydrogen affinities of nitrogen and oxygen bases. Hybridization effects, *J. Am. Chem. Soc.* **97**, 4137 (1975).
- [4528] Steiger, R. A., and Cater, E. D. Vaporization, thermodynamics, and dissociation energy of yttrium monosulfide, *High Temp. Sci.* **7**, 204 (1975).
- [4529] Cocke, D. L., Gingerich, K. A., and Kordis, J. Atomization energies of gaseous EuAu, EuAu₂, EuRh, RhAu, Eu₂, and EuAg, and predicted stability of selected diatomic europium compounds, *High Temp. Sci.* **7**, 61 (1975).
- [4530] Van Veen, E. H., and Plantenga, F. L. Threshold electron-impact excitation spectrum of pyridine, *Chem. Phys. Letters* **30**, 28 (1975).
- [4531] Heilbronner, E., Brogli, F., and Vogel, E. Photoelectron spectroscopic assignment of symmetry to the ground state and first excited state of the 1,4-cyclohexadiene radical cation, *J. Electron Spectrosc. Relat. Phenom.* **9**, 227 (1976).
- [4532] Cocke, D. L., Gingerich, K. A., and Kordis, J. Gaseous phosphorus compounds XI. Thermodynamic investigation of the gaseous molecule RhP₂, *High Temp. Sci.* **7**, 20 (1975).
- [4533] Kaposi, O., Riedel, M., and Sánchez, G. R. Mass-spectrometric study of electron-impact and heterogeneous pyrolytic decomposition of methyl bromide, *Acta Chim. Acad. Sci. Hung.* **85**, 361 (1975).
- [4534] Selim, E. T. M. Electron impact study of benzene, *Egypt. J. Phys.* **7**, 91, (1976).
- [4535] Mouvier, G., and Hernández, R. Ionisation and appearance potentials of alkylketones, *Org. Mass Spectrom.* **10**, 958 (1975).
- [4536] Weiner, M. A., and Lattman, M. Ultraviolet photoelectron spectra of 4-substituted pyridineboranes, *Inorg. Nucl. Chem. Lett.* **11**, 723 (1975).
- [4537] Wieczorek, J. S., Koenig, T., and Balle, T. The He(I) photoelectron spectra of amine *n*-oxides, *J. Electron Spectrosc. Relat. Phenom.* **6**, 215 (1975).
- [4538] Van Hoorn, M. D. He(I) ionisation potentials and MO calculations of butenyne and the monomethyl-substituted butenynes, *J. Electron Spectrosc. Relat. Phenom.* **6**, 65 (1975).
- [4539] Radwan, T. N., and Turner, D. W. Molecular photoelectron spectroscopy. Part V. Ozone, *J. Chem. Soc. (A)*, 85 (1966).
- [4540] Allan, M., Heilbronner, E., and Kaupp, G. 203. The photoelectron spectrum of dibenzo-*p*-quinodimethane, *Helv. Chim. Acta* **59**, 1949 (1976).
- [4541] Haselbach, E., and Rossi, M. 33. Electronic structure, molecular conformation and reactivity of benzonorboradiene systems, *Helv. Chim. Acta* **59**, 278 (1976).
- [4542] Salahub, D. R., and Boschi, R. A. A pot-pourri of UV and PE spectra of iodides, *Chemical spectroscopy and photochemistry in the vacuum-ultraviolet* 191 (1974).
- [4543] Harland, P. W., Rankin, D. W. H., and Thynne, J. C. J. Ionisation by electron impact of phosphorus trifluoride and difluorocyanophosphine, *Int. J. Mass Spectrom. Ion Phys.* **13**, 395 (1974).
- [4544] Hildenbrand, D. L. Dissociation energy and ionization potential of the molecule CF, *Chem. Phys. Letters* **32**, 523 (1975).
- [4545] Lossing, F. P., and Traeger, J. C. Stabilization in cyclopentadienyl, cyclopentenyl, and cyclopentyl cations, *J. Am. Chem. Soc.* **97**, 1579 (1975).
- [4546] Flesch, G. D., and Svec, H. J. Thermochemistry of vanadium oxytrichloride and vanadium oxytrifluoride by mass spectrometry, *Inorg. Chem.* **14**, 1817 (1975).
- [4547] Katsumata, S., and Kimura, K. Photoelectron spectra and sum rule consideration. Effect of chlorine substitution on ionization energies for chloroethanes, chloroacetaldehydes and chloroacetyl chlorides, *J. Electron Spectrosc. Relat. Phenom.* **6**, 309 (1975).

- [4548] Green, M. M., Bafus, D., and Franklin, J. L. Short communication; Combined deuterium labeling and appearance potential measurements to uncover competing reaction mechanisms in the electron-impact-induced loss of water from cyclohexanol, *Org. Mass Spectrom.* **10**, 679 (1975).
- [4549] Wittel, K., Astrup, E. E., Bock, H., Graeffe, G., and Juslén, H. Photoelectron spectra and molecular properties. XLVIII Carbonates and thiocarbonates, *Z. Naturforsch.* **30b**, 862 (1975).
- [4550] Wu, M., and Fehlner, T. P. Valence level photoelectron spectra of some heavy group 4-6 diatomic molecules, *J. Am. Chem. Soc.* **98**, 7578 (1976).
- [4551] Maier, J. P., Muller, J.-F., Kubota, T., and Yamakawa, M. 183. Ionisation energies and the electronic structures of the N-oxides of azanaphthalenes and azaanthracenes, *Helv. Chim. Acta* **58**, 1641 (1975).
- [4552] Streets, D. G., and Berkowitz, J. The structure of Tl_2F_2 from photoelectron spectroscopy, *Chem. Phys. Letters* **38**, 475 (1976).
- [4553] Ravishankara, A. R., and Hanrahan, R. J. An electron impact investigation of 1,1,2,2-tetrafluorocyclobutane, *J. Phys. Chem.* **79**, 876 (1975).
- [4554] Hildenbrand, D. L. Vertical ionization potential of the CF_2 radical, *Chem. Phys. Letters* **30**, 32 (1975).
- [4555] Guimon, C., Arbelot, M., and Pfister-Guillouzo, G. Structure électronique de dérivés sulfures-VIII. Spectres photoélectroniques et électroniques d'hétérocycles thiocarbonylés benzo-substitués, *Spectrochim. Acta* **31A**, 985 (1975).
- [4556] Gusarov, A. V., Gotkis, I. S., and Gorokhov, L. N. Mass-spectrometric study of the evaporation products of the $B_2O_3 - WO_3$ system; Heat of formation of BWO_3 (gas), *High Temp. (USSR)* **13**, 324 (1975).
- [4557] Khandelwal, S. C., and Roebber, J. L. The photoelectron spectra of tetraphenylporphine and some metallotetraphenylporphyrins, *Chem. Phys. Letters* **34**, 355 (1975).
- [4558] Bock, H., Ensslin, W., Fehér, F., and Freund, R. Photoelectron spectra and molecular properties. LI. Ionization potentials of silanes Si_nH_{2n+2} , *J. Am. Chem. Soc.* **98**, 668 (1976).
- [4559] Lappert, M. F., Pedley, J. B., Sharp, G. J., and Guest, M. F. Bonding studies of compounds of boron and elements of groups 3-5, *J. Chem. Soc. Faraday Trans. II* **72**, 539 (1976).
- [4560] Rauh, E. G., and Ackermann, R. J. The first ionization potentials of neptunium and neptunium monoxide, *J. Chem. Phys.* **62**, 1584 (1975).
- [4561] Ames, D. L., and Turner, D. W. Photoelectron spectroscopic studies of dinitrogen tetroxide and dinitrogen pentoxide, *Proc. R. Soc. London Ser. A* **348**, 175 (1976).
- [4562] Fragala, I., Condorelli, G., Zanella, P., and Tondello, E. Photoelectron spectroscopy of actinide organometallic compounds I. Bis (cyclooctatetraene)actinide(IV) complexes, *J. Organometal. Chem.* **122**, 357 (1976).
- [4564] Utsunomiya, C., Kobayashi, T., and Nagakura, S. Photoelectron spectra of electron donor-acceptor complexes between bromine and alkylamines, *Chem. Phys. Letters* **39**, 245 (1976).
- [4565] Symon, D. A., and Waddington, T. C. Valence-band photoelectron spectra of some dicarbonyl(η -cyclopentadienyl)(ligand)iron compounds and tetrakis [carbonyl(η -cyclopentadienyl)iron(1)], *J. Chem. Soc. Dalton Trans.* 2140 (1975).
- [4566] Flamini, A., Semprini, E., Stefani, F., Sorriso, S., and Cardaci, G. He(I) photoelectron spectra and semiempirical molecular-orbital calculations on methylmetal halides of group 4A elements, *J. Chem. Soc. Dalton Trans.* 731 (1976).
- [4567] Gounelle, Y., Jullien, J., Solgadi, D., Botter, R., and Menes, F. No. 157. - Effets de l'isomérisation sur les potentiels d'ionisation: Spectres des photoélectrons de dihalogéno-benzènes, *J. Chim. Phys.* **10**, 1094 (1975).
- [4568] Ihle, H. R., and Wu, C. H. Mass spectrometric determination of the ionization potential and dissociation energy of LiD, *J. Chem. Phys.* **63**, 1605 (1975).
- [4569] Batich, C., Heilbronner, E., Quinn, C. B., and Wiseman, J. R. The electronic structure of vinyl ethers and sulfides with interrupted conjugation examined by photoelectron spectroscopy, *Helv. Chim. Acta* **59**, 512 (1976).
- [4570] Lichtenberger, D. L., and Fenske, R. F. The helium(I) photoelectron spectra and electronic structure of (η^1 -Cyclopentadienyl) d⁰ metal carbonyls, *J. Am. Chem. Soc.* **98**, 50 (1976).
- [4571] Cauletti, C., and Furlani, C. He(I) photoelectron spectra of bis(β -diketonate)nickel(II) complexes and their mono- and di-thio analogues, *J. Electron Spectrosc. Relat. Phenom.* **6**, 465 (1975).
- [4572] Bischof, P., Gleiter, R., Hafner, K., Kobayashi, M., and Spanget-Larsen, J. Polarized absorption and photoelectron spectra of aceheptylene, 3,5-dimethylaceheptylene and 3,5,8,10-tetramethylaceheptylene, *Ber. Bunsenges.* **80**, 532 (1976).
- [4573] Behan, J. M., Dean, F. M., and Johnstone, R. A. W. Photoelectron spectra of cyclic aromatic ethers. The question of the Mills-Nixon effect, *Tetrahedron* **32**, 167 (1976).
- [4574] Fehlner, T. P., Ulman, J., Nugent, W. A., and Kochi, J. K. Effect of alkyl substituents on the first ionization potential and on $5d^{10}$ ionization in dialkylmercury compounds, *Inorg. Chem.* **15**, 2544 (1976).
- [4575] Carlier, P., Dubois, J. E., Masclet, P., and Mouvier, G. Spectres de photoélectrons des alcynes, *J. Electron Spectrosc. Relat. Phenom.* **7**, 55 (1975).
- [4576] Battiste, D. R., Davis, L. P., and Nauman, R. V. Photoelectron spectroscopy and quantum chemical analysis of some N-nitrosamines, *J. Am. Chem. Soc.* **97**, 5071 (1975).
- [4577] Brown, R. S. A photoelectron investigation of the peroxide bond, *Can. J. Chem.* **53**, 3439 (1975).
- [4578] Johnson, I. Mass spectrometric study of the vaporization of cesium and sodium molybdates, *J. Phys. Chem.* **79**, 722 (1975).
- [4579] Starzewski, K. A. O., and Bock, H. Photoelectron spectra and molecular properties. 58.^{1,2} Phosphorus ylides: Gas phase ionization potentials and charge distribution, *J. Am. Chem. Soc.* **98**, 8486 (1976).
- [4580] Hildenbrand, D. L. Thermochemistry of the gaseous tungsten fluorides, *J. Chem. Phys.* **62**, 3074 (1975).
- [4581] Bock, H., Wittel, K., Veith, M., and Wiberg, N. Photoelectron spectra and molecular properties. L.¹⁻³ On the blue color of bis(trimethylsilyl)diimine, *J. Am. Chem. Soc.* **98**, 109 (1976).
- [4582] Brown, C. M., Tilford, S. G., Tousey, R., and Ginter, M. L. Absorption spectrum of Si I between 1500 and 1900 Å, *J. Opt. Soc. Am.* **64**, 1665 (1974).
- [4583] Brown, C. M., Tilford, S. G., and Ginter, M. L. Absorption spectrum of Ca I in the 1580-2090 Å region, *J. Opt. Soc. Am.* **63**, 1454 (1973).
- [4584] Elbel, S., Dieck, H. t., Becker, G., and Ensslin, W. Photoelectron spectra of group 5 compounds. II. Conformational analysis of diphosphine (P_2H_4), *Inorg. Chem.* **15**, 1235 (1976).
- [4585] Fragala, I., Ciliberto, E., Fischer, R. D., Siemel, G. R., and Zanella, P. Photoelectron spectroscopy of f-element organometallic compounds II. Tricyclopentadienyl derivatives of uranium (IV) and thorium (IV), *J. Organometal. Chem.* **120**, C9 (1976).
- [4586] Dolby, L. J., Hanson, G., and Koenig, T. The He I

- photoelectron spectra of *N*-methylisindole and *N*-methylindole, *J. Org. Chem.* **41**, 3537 (1976).
- [4587] Frost, D. C., Lee, S. T., McDowell, C. A., and Westwood, N. P. C. The photoelectron spectra of diazene, diazene-*d*₂, and *trans*-methyldiazene, *J. Chem. Phys.* **64**, 4719 (1976).
- [4588] Gibbins, S. G., Lappert, M. F., Pedley, J. B., and Sharp, G. J. Bonding studies of transition-metal complexes. Part II. Helium-I photoelectron spectra of homoleptic *d*⁰, *d*¹, and *d*¹⁰tetrakis(dialkylamides) of transition and group 4B metals and tungsten hexakis(dimethylamide), *J. Chem. Soc. Dalton* **72** (1975).
- [4589] Distefano, G., Pignataro, S., Ricci, A., Colonna, F. P., and Pietropaolo, D. Interactions of π orbitals with the group IV elements studied by ionization energy measurements, *Ann. Chim.* **64**, 153 (1974).
- [4590] Albini, A., and Mark, F. Photoelectron spectra of phenazine *N*-oxide and some of its derivatives, *J. Chem. Soc., Faraday Trans. II* **72**, 463 (1976).
- [4591] Lossing, F. P., and Traeger, J. C. Free radicals by mass spectrometry XLVI. Heats of formation of C₃H₇[•] and C₃H₉[•] radicals and cations, *Intern. J. Mass Spectrom. Ion Phys.* **19**, 9 (1975).
- [4592] Evlasheva, T. I., Potapov, V. K., and Tulupov, V. A. The structure of the ammonium chloride molecule, *Russ. J. Phys. Chem.* **49**, 738 (1975).
- [4593] Dougherty, D., Bloomfield, J. J., Newkome, G. R., Arnett, J. F., and McGlynn, S. P. Photoelectron spectra of carbonyls. Propellenes and propellanones, *J. Phys. Chem.* **80**, 2212 (1976).
- [4595] Bastide, J., and Maier, J. P. Electronic states of the radical cations of the 1,3-dipoles: HCNO, CH₂N₂, and N₃H, studied by photoelectron spectroscopy, *Chem. Phys.* **12**, 177 (1976).
- [4596] Dyke, J., Jonathan, N., Lee, E., and Morris, A. Vacuum ultraviolet photoelectron spectroscopy of transient species, *J. Chem. Soc. Faraday Trans. II* **72**, 1385 (1976).
- [4597] Bulgin, D. K., Dyke, J. M., and Morris, A. Hel photoelectron spectrum of the P₂(X¹Σ_g⁺) molecule, *J. Chem. Soc. Faraday Trans. II* **72**, 2225 (1976).
- [4598] Krause, J. R., and Bidinosti, D. R. Mass spectrometric studies of the ionization and thermal decomposition of tungsten π -cyclopentadienyl tricarbonyl dimer, *Can. J. Chem.* **53**, 628 (1975).
- [4599] Dougherty, D., Wittel, K., Meeks, J., and McGlynn, S. P. Photoelectron spectroscopy of carbonyls. Ureas, uracils, and thymine, *J. Am. Chem. Soc.* **98**:13, 3815 (1976).
- [4600] Paetzold, R., and Abd-el-Mottaleb, S. Correlative studies of some spectroscopic and bonding parameters in octahedrally coordinated metal carbonyl complexes, *J. Mol. Struct.* **24**, 357 (1975).
- [4602] Dixon, R. N., Duxbury, G., Rabalais, J. W., and Åsbrink, L. Ro-vibronic structure in the photoelectron spectra of H₂O, D₂O and HDO, *Mol. Phys.* **31**, 423 (1976).
- [4603] Phillips, G. R., Russell, M. E., and Solka, B. H. The structure of the [C₂H₅O]⁺ ion in the mass spectrum of diethyl ether, *Org. Mass. Spectrom.* **10**, 819 (1975).
- [4604] DeKock, R. L., Shehfeh, M. A., Lloyd, D. R., and Roberts, P. J. Ultraviolet photoelectron spectra of thiazyl chloride, *J. Chem. Soc. Faraday Trans. II* **72**, 807 (1976).
- [4606] Smith, J. A., and Pong, W. Ultraviolet photoelectron spectra of cesium halides, *Phys. Rev. B.* **12**, 5931 (1975).
- [4607] Chantry, P. J. Positive ion appearance potentials measured in Cel₃, *J. Chem. Phys.* **65**, 4421 (1976).
- [4608] Dewar, M. J. S., Fonken, G. J., Jones, T. B., and Minter, D. E. Photoelectron spectra of molecules. Part VII. Cyclopropylallenes, *J. Chem. Soc. Perkin II*, 764 (1976).
- [4609] Koenig, T., Snell, W., and Chang, J. C. The He(I) photoelectron spectra of benzyl and α -cyanoisopropyl radicals, *Tetrahedron Letters*, **50**, 4569 (1976).
- [4610] Balkis, T., Gaines, A. F., Özgen, G., Özgen, I. T., and Flowers, M. C. Ionization of hydrogen sulphide, selenide and telluride by electron impact, *J. Chem. Soc. Faraday Trans. II* **72**, 524 (1976).
- [4611] Güsten, H., Klasinc, L., Tóth, T., and Knop, J. V., Photoelectron spectroscopy of heterocycles. 5H-dibenzo(a,d) cycloheptene analogs, *J. Electron Spectrosc. Relat. Phenom.* **8**, 417 (1976).
- [4612] Clark, J. P., and Green, J. C. The He-I photoelectron spectra of uranocene and thorocene, *J. Organometal. Chem.* **112**, C14 (1976).
- [4613] Chau, F. T., and McDowell, C. A. Photoelectron spectra of 1,2-dibromo-1,1-difluoroethane, 1,2-bromochloroethane, and 1,2-dichloro-, 1,2-dibromo-, and 1,2-diiodotetrafluoroethane, *J. Phys. Chem.* **80**, 2923 (1976).
- [4614] Koenig, T., Balle, T., and Snell, W. Helium(I) photoelectron spectra of organic radicals, *J. Am. Chem. Soc.* **97**, 662, (1975).
- [4615] Gardner, J. L., and Samson, J. A. R. Photoion and photoelectron spectroscopy of CO and N₂, *J. Chem. Phys.* **62**, 1447 (1975).
- [4616] Koenig, T., Smith, M., and Snell, W. The He(I) photoelectron spectrum of cyclopentadienone, *J. Am. Chem. Soc.* **99**, 6663 (1977).
- [4617] Derrick, P. J., Holmes, J. L., and Morgan, R. P. Kinetics and mechanisms of the loss of water from the cyclohexanol radical ion at times from 50 picoseconds to 10 microseconds following field ionization, *J. Am. Chem. Soc.* **97**, 4936 (1975).
- [4618] Clements, P. J., and Sale, F. R. A mass spectrometric study of nickel tetracarbonyl, iron pentacarbonyl and binary mixtures of these compounds, *Metall. Trans.* **7B**, 171 (1976).
- [4619] Brown, R. S. The influence of remote substituents upon ionization potential. Part I. The effect of two allylic oxygens upon the ionization of the π -bond, *Can. J. Chem.* **54**, 805 (1976).
- [4620] Distefano, G., Pignataro, S., Szepes, L., and Borossay, J. Photoelectron spectroscopy study of the triphenyl derivatives of the group IV elements, *J. Organometal. Chem.* **104**, 173 (1976).
- [4621] Behan, J. M., Johnstone, R. A. W., and Bentley, T. W. An evaluation of empirical methods for calculating the ionization potentials of substituted benzenes, *Organic Mass Spectrom.* **11**, 207 (1976).
- [4622] Arnold, D. E. J., and Rankin, D. W. H. Preparation and properties of diaminodifluorophosphorane, *J. Chem. Soc. Dalton* **1130** (1976).
- [4623] Debies, T. P., and Rabalais, J. W. Calculated photoionization cross-sections and angular distributions for the isoelectronic series Ne, HF, H₂O, NH₃, and CH₄, *J. Am. Chem. Soc.* **97**, 487 (1975).
- [4624] Ackermann, R. J., Rauh, E. G., and Thorn, R. J. The thermodynamics of ionization of gaseous oxides; the first ionization potentials of the lanthanide metals and monoxides, *J. Chem. Phys.* **65**, 1027 (1976).
- [4625] Bradshaw, D. I., Moyes, R. B., and Wells, P. B. Mass spectra of some deuterium-labelled methylsilanes and the analysis of mixtures, *Can. J. Chem.* **54**, 599 (1976).
- [4626] Fringuelli, F., Marino, G., Taticchi, A., Distefano, G., Colonna, F. P., and Pignataro, S. Photoelectron spectra of the α -substituted derivatives of furan, thiophen, selenophen, and tellurophen. A comparative study of the molecular orbital energies, *J. Chem. Soc. Perkin Trans. II*, 276 (1976).
- [4627] Colonna, F. P., Danieli, R., Distefano, G., and Ricci, A. The electronic effect of XMe₃ and CH₂XMe₃ (X=Si, Ge, Sn, or Pb) substituents in organometallic sulphides. A kinetic and photoelectron spectroscopic study, *J. Chem. Soc.*

- Perkin Trans. **II**, 306 (1976).
- [4628] Györosi, P., Hvistendahl, G., and Undheim, K. Mass spectrometry of some triphenylcyclopropenium salts. Competition between dimerisation and adduct formation, *Org. Mass Spectrom.* **10**, 744 (1975).
- [4629] Gardner, J. L., and Samson, J. A. R. Photoion and photoelectron spectroscopy of oxygen, *J. Chem. Phys.* **62**, 4460 (1975).
- [4630] Eland, J. H. D., Frey, R., Schulte, H., and Brehm, B. New results on the fragmentation of the benzene ion, *Intern. J. Mass Spectrom. Ion Phys.* **21**, 209 (1976).
- [4631] Yamazaki, T., and Kimura, K. He I photoelectron spectrum of dinitrogen tetroxide (N_2O_4), *Chem. Phys. Letters* **43**, 502 (1976).
- [4632] Diemann, E., Varetto, E. L., and Müller, A. The He(I) photoelectron spectra of the substituted permanganates MnO_3F and MnO_3Cl , *Chem. Phys. Letters* **51**, 460 (1977).
- [4633] Delwiche, J. P.; Praet, M.-Th., Caprace, G., Hubin-Franskin, M.-J., Natalis, P., and Collin, J. E. The photoelectron spectra of perfluoro-2-butyne and perfluorohexa-2,4-diyne. The perfluorination effect, *J. Electron Spectrosc. Relat. Phenom.* **12**, 395 (1977).
- [4634] Dyke, J., Jonathan, N., Lee, E., Morris, A., and Winter, M. Vacuum ultraviolet photoelectron spectroscopy of transient species: Part 8, the *t*-butyl radical, *Physica Scripta* **16**, 197 (1977).
- [4635] Peel, J. B., and Willett, G. D. The photoelectron spectra of arsenic tribromide and arsenic triiodide, *J. Electron Spectrosc. Relat. Phenom.* **9**, 175 (1976).
- [4636] Maier, J. P., and Sweigart, D. A. Ultraviolet photoelectron spectra of nickel, palladium, and platinum diethyl dithiophosphate complexes, *Inorg. Chem.* **15**, 1989 (1976).
- [4637] Gleiter, R., Spanget-Larsen, J., Thulstrup, E. W., Murata, I., Nakasuji, K., and Jutz, C. 155. The electronic structure of azuleno[1,2,3-*cd*] phenalene and azuleno[5,6,7-*cd*]phenalene, a comparison, *Helv. Chim. Acta* **59**, 1459 (1976).
- [4638] Müller, C., Schäfer, W., Schweig, A., Thon, N., and Vermeer, H. Detection of rotational isomers by variable temperature photoelectron spectroscopy. A new technique in the realm of molecular conformational analysis, *J. Am. Chem. Soc.* **98**, 5440 (1976).
- [4639] Diemann, E. The orbital electronic structure of the As_3O_6 molecule by photoelectron spectroscopy, *Inorg. Chim. Acta* **24**, L27 (1977).
- [4640] Tsai, B. P., Baer, T., Werner, A. S., and Lin, S. F. A photoelectron-photoion coincidence study of the ionization and fragment appearance potentials of bromo- and iodomethanes, *J. Phys. Chem.* **79**, 570 (1975).
- [4641] Klasinc, L. Application of photoelectron spectroscopy to biologically active molecules and their constituent parts, *J. Electron Spectrosc. Relat. Phenom.* **8**, 161 (1976).
- [4642] Williams, T. A., and Potts, A. W. Complexities in the He I photoelectron spectra of alkali metal vapours, *J. Electron Spectrosc. Relat. Phenom.* **8**, 331 (1976).
- [4643] Potts, A. W., and Williams, T. A. The He I photoelectron spectrum of TeO , *Chem. Phys. Letters* **42**, 550 (1976).
- [4644] Peng, S., Padva, A., and LeBreton, P. R. Ultraviolet photoelectron studies of biological purines: The valence electronic structure of adenine, *Proc. Nat. Acad. Sci. U.S.A.* **73**, 2966 (1976).
- [4645] Pullen, B. P., and Stockdale, J. A. D. Dissociative ionization of SF_6 by electron impact, *Intern. J. Mass Spectrom. Ion Phys.* **19**, 35 (1976).
- [4646] Popkie, H. E., Koski, W. S., and Kaufman, J. J. Ab-Initio LCAO-MO-SCF calculations of morphine and nalorphine and measurement of their photoelectron spectra, *J. Am. Chem. Soc.* **98**, 1342 (1976).
- [4647] White, M. G., Colton, R. J., Lee, T. H., and Rabalais, J. W. Electronic structure of *N,N*-dimethylnitramine and *N,N*-dimethylnitrosamine from X-ray and uv electron spectroscopy, *Chem. Phys.* **8**, 391 (1975).
- [4648] McGlynn, S. P., and Meeks, J. L. Photoelectron spectra of carbonyls, carbonates, oxalates and esterification effects, *J. Electron Spectrosc. Relat. Phenom.* **8**, 85 (1976).
- [4649] Young, V. Y., and Cheng, K. L. The ultraviolet photoelectron spectra of aliphatic and aromatic isonitriles, *J. Electron Spectrosc. Relat. Phenom.* **9**, 317 (1976).
- [4650] Dargelos, A., Sandorfy, C. The photoelectron and far-ultraviolet absorption spectra of simple oximes, *J. Chem. Phys.* **67**, 3011 (1977).
- [4651] Domelsmith, L. N., Houk, K. N., Timberlake, J. W., and Szilagyi, S. The photoelectron spectrum of tetramethyldiazetene: The elucidation of ring size effects on azo group ionization potentials, *Chem. Phys. Letters* **48**, 471 (1977).
- [4652] Wirz, J. 173. Electronic structure and photophysical properties of planar conjugated hydrocarbons with 4n-membered rings. I. Photoelectron spectra of 1,5,9-tridehydro[12]-annulene and related compounds, *Helv. Chim. Acta* **59**, 1647 (1976).
- [4653] Wittel, K., Felps, W. S., Klasinc, L., and McGlynn, S. P. Molecular Rydberg transitions. VI. *trans*-dibromoethylene. The relation between vacuum ultraviolet and photoelectron spectroscopy, *J. Chem. Phys.* **65**, 3698 (1976).
- [4654] Domelsmith, L. N., and Houk, K. N. Photoelectron spectra of cyclopentanone and cyclohexanone enamines, *Tetrahedron Letters* **23**, 1981 (1977).
- [4655] Guyon, P.-M., Spohr, R., Chupka, W. A., and Berkowitz, J. Threshold photoelectron spectra of HF , DF , and F_2 , *J. Chem. Phys.* **65**, 1650 (1976).
- [4656] Van Veen, E. H. Triplet $\pi \rightarrow \pi^*$ transitions in thiophene, furan and pyrrole by low-energy electron-impact spectroscopy, *Chem. Phys. Letters* **41**, 535 (1976).
- [4657] Dyke, J. M., Morris, A., and Trickle, I. R. Characterization of the ground ionic state of the NS molecule using photoelectron spectroscopy, *J. Chem. Soc. Faraday Trans. II*, **73**, 147 (1977).
- [4658] Van Veen, E. H., and Plantenga, F. L. Low-energy electron-impact excitation spectra of acetylene, *Chem. Phys. Letters* **38**, 493 (1976).
- [4659] Gleiter, R., Kobayashi, M., and Kuthan, J. The *n*-orbital sequence in 1,3 diazaadamantane, *Tetrahedron* **32**, 2775 (1976).
- [4660] Compennolle, F., and DeSchryver, F. Nonconcerted cycloreversion by electron impact of substituted 2,4-azetidinediones. Relations between the mass spectral and photochemical reactions, *J. Am. Chem. Soc.* **97**, 3909 (1975).
- [4661] Efraty, A., Huang, M. H. A., and Weston, C. A. Mass spectra of organometallic compounds. V. Electron-impact study of the cyclopentadienylmanganese thiocarbonyl and carbonyl complexes $RC_5H_5Mn(CO)_2CX$ [$R=H, CH_3$; $X=S, O$], *Inorg. Chem.* **14**, 2796 (1975).
- [4662] Streets, D. G., and Berkowitz, J. Photoelectron spectroscopy of Se_2 and Te_2 , *J. Electron Spectrosc. Relat. Phenom.* **9**, 269 (1976).
- [4663] Shevchenko, V. E., Iljin, M. K., Nikitin, O. T., and Sidorov, L. N. Mass-spectrometric study of mixed dimers M_2BO_2F , *Intern. J. Mass Spectrom. Ion Phys.* **21**, 279 (1976).
- [4664] Innorta, G., Torroni, S., Distefano, G., Pietropaolo, D., and Ricci, A. Mass spectra and energetic data for the formation of the $[M-CH_3]^+$ ion of 10,10-dimethylphenylthio-silyl-, -germyl- and -stannyl- derivatives, and of 9,9-dimethylthioxantene, *Org. Mass Spectrom.* **12**, 766 (1977).
- [4665] Pfeffer, H.-U., Klessinger, M., Erker, G., and Roth, W. R.

- Photoelektronenspektren organischer Verbindungen, VIII 7,8-Dimethylenbicyclo [2.2.2]octa-2,5-dien und verwandte Verbindungen, Chem. Ber. **108**, 2923 (1975).
- [4666] Thorstad, O., Undheim, K., Cederlund, B., and Hörnfeldt, A.-B. Ionisation potentials in tautomeric analysis of 2-hydroxy derivatives of thiophenes, selenophenes, and furans, Acta Chem. Scand. **B29**, 647 (1975).
- [4667] Domelsmith, L. N., Munchausen, L. L., and Houk, K. N. Photoelectron spectra of psychotropic drugs. 2. Phenothiazine and related tranquilizers, J. Am. Chem. Soc. **99**, 6506 (1977).
- [4668] Gilbert, W. C., Taylor, L. T., and Dillard, J. G. Mass spectrometric study of polydentate Schiff base coordination compounds. 1. Cobalt(II), nickel(II), and copper(II) complexes of salen and oaben, J. Am. Chem. Soc. **95**, 2477 (1973).
- [4669] Wiberg, K. B., Ellison, G. B., Wendoloski, J. J., Brundle, C. R., and Kuebler, N. A. Electronic states of organic molecules. 3. Photoelectron spectra of cycloalkenes and methylenecycloalkanes, J. Am. Chem. Soc. **98**, 7179 (1976).
- [4670] Dehmer, P. M., and Dehmer, J. L. Photoelectron spectrum of the Xe₂ van der Waals molecule, J. Chem. Phys. **67**, 1774 (1977).
- [4671] Van Veen, E. H. Low-energy electron-impact spectroscopy on ethylene, Chem. Phys. Letters **41**, 540 (1976).
- [4672] Domelsmith, L. N., Munchausen, L. L., and Houk, K. N. Photoelectron spectra of psychotropic drugs. 1. Phenethylamines, tryptamines, and LSD, J. Am. Chem. Soc. **99**, 4311 (1977).
- [4673] Thorstad, O., Undheim, K., Lantz, R., and Hörnfeldt, A.-B. Ionisation potentials in tautomeric analysis of 3-hydroxy derivatives of thiophenes, selenophenes, and furans, Acta Chem. Scand. **B29**, 652 (1975).
- [4674] Bastide, J., Maier, J. P., and Kubota, T. Ionisation energies and electronic structures of the phenyl 1,3-dipoles, J. Electron Spectrosc. Relat. Phenom. **9**, 307 (1976).
- [4675] Vilesov, F. I., and Lopatin, S. N. Photoelectron spectrometer, Zh. Tekh. Fiz. **42**, 176 (1972).
- [4676] Bieri, G. Cyanogen fluoride: A photoelectron-spectroscopic investigation, Chem. Phys. Letters **46**, 107 (1977).
- [4677] Thorstad, O., Undheim, K., and El-Gendy, M. A. F. Ionisation potentials in structure analysis of isomeric nitrones, oxaziranes, O-ether oximes and acid amides, Org. Mass Spectrom. **10**, 1155 (1975).
- [4678] Smoes, S., Drowart, J., and Myers, C. E. Determination of the atomization energies of the molecules TaO(g) and TaO₂(g) by the mass-spectrometric Knudsen-cell method, J. Chem. Thermodyn. **8**, 225 (1976).
- [4679] Staley, R. H., Kleckner, J. E., and Beauchamp, J. L. Relationship between orbital ionization energies and molecular properties. Proton affinities and photoelectron spectra of nitriles, J. Am. Chem. Soc. **98**, 2081 (1976).
- [4680] Solouki, B., Rosmus, P., and Bock, H. Unstable intermediates. 4. Thioformaldehyde, J. Am. Chem. Soc. **98**, 6054 (1976).
- [4681] Bieri, G., Heilbronner, E., Stadelmann, J.-P., Vogt, J., and von Niessen, W. Electronic states of difluoroacetylene, difluorodiacetylene, and perfluoropentadiene-1,3 radical cations. A photoelectron spectroscopic investigation, J. Am. Chem. Soc. **99**, 6832 (1977).
- [4682] Drowart, J., and Smoes, S. Determination by the mass spectrometric Knudsen cell method and discussion of the dissociation energies of the molecules Se₂(g), SSe(g) and SeTe(g), J. Chem. Soc. Faraday Trans. II **73**, 1755 (1977).
- [4683] Block, T. F., Biernbaum, M., and West, R. Cyclic polysilanes XII. Photoelectron spectra and bonding in 1,2,3,4-tetra-*t*-butyltetramethylcyclotetrasilane and related *t*-butylsilicon compounds, J. Organometal. Chem. **131**, 199 (1977).
- [4684] Botter, R., Gounelle, Y., Henry, Y., Jullien, J., Menes, F., and Solgadi, D. Photoelectron spectra of halogeno-3-propynes (XCH₂≡CH) and halogeno- methylcyanides (XCH₂C≡N) and comments on the attribution of fluorine IP, J. Electron Spectrosc. Relat. Phenom. **10**, 393 (1977).
- [4685] Bulgin, D. K., Dyke, J. M., and Morris, A. Vacuum ultraviolet photoelectron spectrum of the PN(X¹Σ⁺) molecule, J. Chem. Soc. Faraday II **73**, 983 (1977).
- [4686] Bieri, G., Dill, J. D., Heilbronner, E., and Maier, J. P. 68. The electronic states of the pentatetraene radical cation, Helv. Chim. Acta **60**, 629 (1977).
- [4687] Paule, R. C. Mass spectrometric studies of Al₂O₃ vaporization processes, High Temp. Sci. **8**, 257 (1976).
- [4688] Schmidt, H., Schweig, A., Anastassiou, A. G., and Wetzel, J. C. The dominant role of hyperconjugation in the 9-oxabicyclo[4.2.1] nona-2,4,7-triene series, Tetrahedron **32**, 2239 (1976).
- [4689] Rothgery, E. F., Holt, R. J., and McGee, H. A., Jr. Cryochemical synthesis and molecular energetics of cyclopropanone and some related compounds, J. Am. Chem. Soc. **97**, 4971 (1975).
- [4690] Božić, Z., Humski, K., Cvitaš, T., and Klasinc, L. Photoelectron spectra of bromo- and iodo- thiophens, J. Chem. Soc. Perkin Trans. II, 1413 (1977).
- [4691] Bünzli, J.-C. G., Olsen, H., and Snyder, J. P. Photoelectron spectra of bicyclic azo *N*-oxides and azo *N,N'*-dioxides, J. Org. Chem. **42**, 614 (1977).
- [4692] Block, T. F., and Fenske, R. F. A photoelectron spectroscopic study of some pentacarbonylchromium carbene complexes, J. Am. Chem. Soc. **99**, 4321 (1977).
- [4693] Bussièrès, N., and Marmet, P. Ionization and dissociative ionization of CO₂ by electron impact, Can. J. Phys. **55**, 1889 (1977).
- [4694] Egdell, R. G., and Orchard, A. F. Photoelectron spectra of the group IVA halides, J. Chem. Soc. Faraday Trans. II **74**, 485 (1978).
- [4695] Ashmore, F. S., and Burgess, A. R. Photoelectron spectra of the unbranched C₂-C₂ alkenes, aldehydes and ketones, J. Chem. Soc. Faraday Trans. II **74**, 734 (1978).
- [4696] Frost, D. C., McDowell, C. A., Pouzard, G., and Westwood, N. P. C. The photoelectron spectra of the oxalyl halides (COX)₂, [X=F, Cl and Br], J. Electron Spectrosc. Relat. Phenom. **10**, 273 (1977).
- [4697] Causley, G. C., Clark, J. B., and Russell, B. R. The vacuum ultraviolet spectrum of bromosilane, Chem. Phys. Letters **38**, 602 (1976).
- [4698] Bock, H., Solouki, B., Bert, G., and Rosmus, P. Unstable Intermediates. 5. Thioketene, J. Am. Chem. Soc. **99**, 1663 (1977).
- [4699] Furlani, C., and Andreocci, M. V. Valence-shell photoionization spectra of some methyl dihalogenophosphates, J. Chem. Soc. Dalton Trans. **7**, 673 (1977).
- [4700] Frost, D. C., McDowell, C. A., and Westwood, N. P. C. The photoelectron spectrum of dinitrogen tetroxide, J. Electron Spectrosc. Relat. Phenom. **10**, 293 (1977).
- [4701] Clar, E., and Schmidt, W. Correlations between photoelectron and phosphorescence spectra of polycyclic hydrocarbons, Tetrahedron **32**, 2563 (1976).
- [4702] Bieri, G., Burger, F., Heilbronner, E., and Maier, J. P. 223. Valence ionization energies of hydrocarbons, Helv. Chim. Acta **60**, 2213 (1977).
- [4703] Brown, R. S., and Marcinko, R. W. Application of photoelectron spectroscopy to intramolecular hydrogen bonding. 6. The relative importance of electrostatic and covalent contributions to the H bond of H-bonded alcohols containing a conjugated olefin as the electron donor, J. Am. Chem. Soc. **99**, 6500 (1977).
- [4704] Cannington, P. H., and Whitfield, H. J. Photoelectron spectra

- of As_3S_6 , P_3S_6 , P_3Se_6 , and As_3O_6 , J. Electron Spectrosc. Relat. Phenom. **10**, 35 (1977).
- [4705] Cowley, A. H., Lattman, M., Montag, R. A., and Verkade, J. G. The coordination behavior of acyclic phosphites; a UV photoelectron spectroscopic study, Inorg. Chim. Acta **25**, 1151 (1977).
- [4706] Cederlund, B., Lantz, R., Hörnfeldt, A.-B., Thorstad, O., and Undheim, K. Preparation of some thiophene-, selenophene- and furanthiols. Ionisation potentials in tautomer analysis, Acta Chem. Scand. Ser. **B31**, 198 (1977).
- [4707] Gleiter, R., Kobayashi, M., Neunhoeffer, H., and Spanget-Larsen, J. Photoelectron spectra of 1,2,4-triazine and some methyl derivatives, Chem. Phys. Letters **46**, 231 (1977).
- [4708] Galasso, V., Colonna, F. P., and Distefano, G. Photoelectron spectra of 1,2-indandione, 1,3-indandione and heterocyclic analogues, J. Electron Spectrosc. Relat. Phenom. **10**, 227 (1977).
- [4709] Gan, T. H., Peel, J. B., and Willett, G. D. Reinterpretation of the photoelectron spectrum of dinitrogen tetroxide, J. Chem. Soc. Faraday Trans. II **73**, 1459 (1977).
- [4710] Cauletti, C., Duffy, N. V., and Furlani, C. L. UV Photoelectron spectra of some substituted iron dithiocarbamates, Inorg. Chim. Acta **23**, 181 (1977).
- [4711] Cook, M. J., El-Abbady, S., Katritzky, A. R., Guimon, C., and Pfister-Guillouzo, G. Photoelectron spectra of hydroxy- and mercapto-pyridines and models of fixed structure, J. Chem. Soc. Perkin II, 1652 (1977).
- [4712] Clar, E., and Schmidt, W. Correlations between photoelectron and ultraviolet absorption spectra of polycyclic hydrocarbons. The perylene, coronene and bisanthene series, Tetrahedron, **33**, 2093 (1977).
- [4713] Egdell, R. G., and Orchard, A. F. He(II) Photoelectron spectra of indium(I) and thallium(I) halides, J. Chem. Soc. Faraday Trans. II **74**, 1179 (1978).
- [4714] Reeher, J. R., Flesch, G. D., and Svec, H. J. The mass spectra and ionization potentials of the neutral fragments produced during the electron bombardment of aromatic compounds, Org. Mass. Spectrom. **11**, 154 (1976).
- [4715] Ensslin, W., Schmidtke, H.-H., and Kühn, Th. Photoelectron spectra and electronic structure of symmetrically *trans*-substituted disilylethylenes, Inorg. Chim. Acta **24**, 159 (1977).
- [4716] Harman, P. J., Kent, J. E., Gan, T. H., Peel, J. B., and Willett, G. D. The photoelectron spectrum of benzvalene, J. Am. Chem. Soc. **99**, 943 (1977).
- [4718] Frost, D. C., LeGeyt, M. R., Paddock, N. L., and Westwood, N. P. C. Helium I photoelectron spectrum of disulphur dinitride, J. Chem. Soc. Chem. Commun. 217 (1977).
- [4719] Houk, K. N., Caramella, P., Munchausen, L. L., Chang, Y.-M., Battaglia, A., Sims, J., and Kaufman, D. C. Photoelectron spectra of nitrones and nitrile oxides, J. Electron Spectrosc. Relat. Phenom. **10**, 441 (1977).
- [4720] Head, R. A., Nixon, J. F., and Clark, R. J. UV photoelectron spectra of first-row transition metal hydridocarbonyl and hydridotrifluorophosphine complexes, J. Organometal. Chem. **135**, 209 (1977).
- [4721] Gan, T. H., Peel, J. B., and Willett, G. D. A comparison of the photoelectron spectra of the trimethyl- and triallyl-orthoformates, Chem. Phys. Letters **51**, 464 (1977).
- [4722] Houle, F. A., and Beauchamp, J. L. Detection and investigation of allyl and benzyl radicals by photoelectron spectroscopy, J. Am. Chem. Soc. **100**, 3290 (1978).
- [4723] Gleiter, R., Bischof, P., Volz, W. E., and Paquette, L. A. Conjugative interaction between II and cyclobutane orbitals. The synthesis and electronic structure of bicyclo[4.1.1]octa-2,4-diene, J. Am. Chem. Soc. **99**, 8 (1977).
- [4724] Gower, M., Kane-Maguire, L. A. P., Maier, J. P., and Sweigart, D. A. Ultraviolet photoelectron spectra of cyclohepta-1,3,5-triene and mesitylene tricarbonyl complexes of the group 6A metals, J. Chem. Soc. Dalton **316** (1977).
- [4725] Harris, D. H., Lappert, M. F., Pedley, J. B., and Sharp, G. J. Bonding studies of compounds of group 3-5 elements. Part XVIII. He(I) photoelectron spectra of bivalent homoleptic alkyls and amides, especially of group 4 elements, and of tin(II) chloride and bromide, J. Chem. Soc. Dalton II, 945 (1976).
- [4726] Bischof, P., Eaton, P. E., Gleiter, R., Heilbronner, E., Jones, T. B., Musso, H., Schmelter, A., and Stober, R. 44. The electronic structure of cubane (C_8H_8) as revealed by photoelectron spectroscopy, Helv. Chim. Acta **61**, 547 (1978).
- [4727] Cvitaš, T., Güsten, H., Klasinc, L., Novadj, I., and Vančik, H. Photoelectron spectra of bromo- and iodotrifluoromethane, Z. Naturforsch. **33a**, 1528 (1978).
- [4728] Bally, T., Buser, U., and Haselbach, E. 1. Tetrakis (methylidene)cyclobutane(C_4H_4) [4radialene]: Electronic states of the molecular ion, Helv. Chim. Acta **61**, 38 (1978).
- [4729] Holmes, J. L., Terlouw, J. K., and Lossing, F. P. The thermochemistry of $\text{C}_2\text{H}_3\text{O}^+$ ions, J. Phys. Chem. **80**, 2860 (1976).
- [4730] Gan, T. H., Peel, J. B., and Willett, G. D. Comparison of He I and He II photoelectron spectra of phosphoryl chloride, Chem. Phys. Letters **48**, 483 (1977).
- [4731] Heilbronner, E., Jones, T. B., and Maier, J. P. 170. The ionization energies of di-*n*-alkyl diacetylenes, Helv. Chim. Acta **60**, 1697 (1977).
- [4732] Gan, T. H., Peel, J. B., and Willett, G. D. Photoelectron spectra of the *gauche* and *trans* conformers of 1,2-dichloroethane, J. Chem. Soc. Faraday Trans. II **73**, 965 (1977).
- [4733] Green, J. C., Lloyd, D. R., Galyer, L., Mertis, K., and Wilkinson, G. Photoelectron spectra of some transition metal alkyls and oxoalkyls, J. Chem. Soc. Dalton Trans. **10**, 1403 (1978).
- [4734] Basso-Bert, M., Cassoux, P., Crasnier, F., Gervais, D., Labarre, J.-F., and DeLoth, P. Molecular orbitals and photoelectron spectra of some titanium(IV) organometallic compounds, J. Organometal. Chem. **136**, 201 (1977).
- [4735] Bewick, A., Edwards, C. J., Jones, S. R., and Mellor, J. M. The electrochemical difunctionalisation of saturated hydrocarbons, Tetrahedron Letters 631 (1976).
- [4736] Conard, B. R., and Sridhar, R. Appearance potentials of ion fragments of iron pentacarbonyl, Can. J. Chem. **56**, 2607 (1978).
- [4737] Colbourne, D., Frost, D. C., McDowell, C. A., and Westwood, N. P. C. The photoelectron spectra of the chloramines NH_2Cl , NHCl_2 , NCl_3 and the methyl chloramines CH_3NHCl , CH_3NCl_2 , and $(\text{CH}_3)_2\text{NCl}$, J. Chem. Phys. **69**, 1078 (1978).
- [4738] Basch, H., Bieri, G., Heilbronner, E., and Jones, T. B. 2. The photoelectron spectrum of tetrafluorobutatriene, Helv. Chim. Acta **61**, 46 (1978).
- [4739] Behan, J., Johnstone, R. A. W., and Puddephatt, R. J. Photoelectron spectra and reactivity of methyl (tertiary phosphine)-platinum and -gold complexes, J. Chem. Soc. Chem. Commun., 444 (1978).
- [4740] Bloch, M., Brogli, F., Heilbronner, E., Jones, T. B., Prinzbach, H., and Schweikert, O. 138. Photoelectron spectra of unsaturated oxides. I. 1,4-dioxin and related systems, Helv. Chim. Acta **61**, 1388 (1978).
- [4741] Nagy-Felsobuki, E., and Peel, J. B. Photoelectron spectra of methylchloramine and methylchloramine, J. Chem. Soc. Faraday Trans. II **74**, 1927 (1978).
- [4742] Gerson, S. H., Worley, S. D., Bodor, N., Kaminski, J. J., and Flechtner, T. W. The photoelectron spectra of some

- heterocyclic compounds which contain N, O, Cl, and Br, J. Electron Spectrosc. Relat. Phenom. **13**, 421 (1978).
- [4743] Colonna, F. P., Distefano, G., Galasso, V., Irgolic, K. J., King, C. E., and Pappalardo, G. C. The conformation, uv-absorption spectra and photoelectron spectra of phenoxachalcogenins, J. Organometal. Chem. **146**, 235 (1978).
- [4744] Eck, V., Schweig, A., and Vermeer, H. The ultraviolet photoelectron spectrum of *o*-benzoquinone methide, Tetrahedron Letters **27**, 2433 (1978).
- [4745] Ehlert, T. C. Mass spectrometric investigations of the oxides of potassium, High Temp. Sci. **9**, 237 (1977).
- [4746] Frost, D. C., Kroto, H. W., McDowell, C. A., and Westwood, N. P. C. The He I photoelectron spectra of the isoelectronic molecules, cyanogen azide, NCN_3 , and cyanogen isocyanate, NCNCO , J. Electron Spectrosc. Relat. Phenom. **11**, 147 (1977).
- [4747] McAlduff, E. J., and Houk, K. N. Photoelectron spectra of substituted oxiranes and thiiranes. Substituent effects on ionization potentials involving σ orbitals, Can. J. Chem. **55**, 318 (1977).
- [4748] Kroner, J., Kosbahn, W., and Runge, W. The molecular structure of allenes and ketenes, IX [1] π and σ interactions in allenes: Photoelectron spectra, electronic absorption spectra, and quantumchemical calculations, Ber. Bunsenges. **81**, 826 (1977).
- [4749] Dehmer, P. M., and Dehmer, J. L. Photoelectron spectrum of Xe_2 and potential energy curves for Xe_2^+ , J. Chem. Phys. **68**, 3462 (1978).
- [4750] Cavell, R. G., and Allison, D. A. Photoelectron spectra of acetylene with $\text{He}^I, \text{He}^{II}, \text{Zr M}$, and MgK_α radiation sources, J. Chem. Phys. **69**, 159 (1978).
- [4751] Carnovale, F., Gan, T. H., and Peel, J. B. Photoelectron spectra of the *gauche* and *trans* conformers of 1,2-bromochloroethane, J. Electron Spectrosc. Relat. Phenom. **16**, 87 (1979).
- [4752] Berkowitz, J., and Eland, J. H. D. Photoionization of N_2O : Mechanisms of photoionization and ion dissociation, J. Chem. Phys. **67**, 2740 (1977).
- [4753] Head, R. A., Nixon, J. F., Westwood, N. P. C., and Clark, R. J. He(I) photoelectron spectra of mixed carbonyltrifluorophosphine complexes of zero-valent iron, J. Organometal. Chem. **145**, 75 (1978).
- [4754] Lauer, G., Schäfer, W., and Schweig, A. Functional subunits in the nucleic acid bases uracil and thymine, Tetrahedron Letters **45**, 3939 (1975).
- [4755] Colbourn, E. A., Dyke, J. M., Fayad, N. K., and Morris, A. The He(I) photoelectron spectra of BrF and IF , J. Electron Spectrosc. Relat. Phenom. **14**, 443 (1978).
- [4756] Kobayashi, M., Gleiter, R., Coffen, D. L., Bock, H., Schulz, W., and Stein, U. Spiroconjugation in orthothiocarbonates, Tetrahedron **33**, 433 (1977).
- [4757] Ajello, J. M., Huntress, W. T., Jr., and Rayermann, P. A photoionization mass spectrometer study of CFCl_3 , CF_2Cl_2 and CF_3Cl , J. Chem. Phys. **64**, 4746 (1976).
- [4758] Domelsmith, L. N., and Houk, K. N. Photoelectron spectroscopic studies of hallucinogens: The use of ionization potentials in QSAR, NIDA Res. Monogr. **22**, 423 (1978).
- [4759] Baldwin, M. A., Loudon, A. G., Webb, K. S., and Cardnell, P. C. Charge location and fragmentation under electron impact, Org. Mass Spectrom. **12**, 279 (1977).
- [4760] Colbourn, E. A., Dyke, J. M., Fackereil, A., Morris, A., and Trickle, I. R. Vacuum ultraviolet photoelectron spectrum of the $\text{GeO}(\text{X}^I\text{Z}^+)$ molecule, J. Chem. Soc. Faraday Trans. II **74**, 2278 (1978).
- [4761] Hammer, C. A., Allen, J. D. Jr., Cusachs, L. C., and Schweitzer, G. K. The high-temperature photoelectron spectra of alkaline-earth chlorides and iodides, J. Electron Spectrosc. Relat. Phenom. **13**, 149 (1978).
- [4762] Berkowitz, J., Eland, J. H. D., and Appelman, E. H. Photoionization mass spectrometry and heat of formation of S_2O , J. Chem. Phys. **66**, 2183 (1977).
- [4763] Colbourn, D., Frost, D. C., McDowell, C. A., and Westwood, N. P. C. The photoelectron spectra of the isoelectronic molecules hypochlorous acid HOCl and chloramine NH_2Cl , J. Chem. Phys. **68**, 3574 (1978).
- [4764] Egdell, R. G., and Orchard, A. F. Photoelectron spectra of some transition metal pentachlorides, J. Electron Spectrosc. Relat. Phenom. **14**, 277 (1978).
- [4765] Bieri, G., Heilbronner, E., Hornung, V., Kloster-Jensen, E., Maier, J. P., Thommen, F., and von Niessen, W. Electronic states of substituted haloacetylene and cyanoacetylene radical cations, Chem. Phys. **36**, 1 (1979).
- [4766] Hemmersbach, P., Klessinger, M., and Bruckmann, P. Electronic structure of *exo*-dimethylenecycloalkanes, J. Am. Chem. Soc. **100**, 6344 (1978).
- [4767] Klessinger, M., and Gunkel, E. The electronic structure of polyenes and unsaturated carbonyl compounds, Tetrahedron **34**, 3591 (1978).
- [4768] Kimura, K., and Katsumata, S. Photoelectron spectroscopic study of hydroxylamine (NH_2OH) and *o*-methylhydroxylamine (NH_2OCH_3), J. Chem. Phys. **67**, 1225 (1977).
- [4769] Nagata, S., Yamabe, T., and Fukui, K. A study of the electronic spectra of thioacetic acid and its ethyl ester, J. Phys. Chem. **79**, 2335 (1975).
- [4770] MacNeil, K. A. G., and Dixon, R. N. High-resolution photoelectron spectroscopy of methanol and its deuterated derivatives: Internal rotation in the ground ionic state, J. Electron Spectrosc. Relat. Phenom. **11**, 315 (1977).
- [4771] Koenig, T., and Southworth, S. The He I photoelectron spectrum of 3,7-dimethyl-*p*-quinodimethane. A non-Koopmans theorem effect, J. Am. Chem. Soc. **99**, 2807 (1977).
- [4772] Gerson, S. H., Worley, S. D., Bodor, N., and Kaminski, J. J. Electronic structures of some antimicrobial *N*-chloramines. Possible existence of intramolecular hydrogen bonding and its effect on germicidal efficiency, J. Med. Chem. **21**, 686 (1978).
- [4773] Katsumata, S., and Lloyd, D. R. The photoelectron spectra of the OH and OD radicals, Chem. Phys. Letters **45**, 519 (1977).
- [4774] Carnovale, F., Livett, M. K., and Peel, J. B. The photoelectron spectrum of the dimethyl etherhydrogen chloride complex, J. Am. Chem. Soc. **102**, 569 (1980).
- [4775] Carnovale, F., Nagy-Felsobuki, E., Peel, J. B., and Willet, G. D. The photoelectron spectra of *N*-bromo-methylamine and *N,N*-dibromo-methylamine, J. Electron Spectrosc. Relat. Phenom. **14**, 163 (1978).
- [4776] Frost, D. C., MacDonald, B., McDowell, C. A., and Westwood, N. P. C. Pyrolysis of trimethyl hexahydro-*s*-triazines. The photoelectron spectra of *N*-methylmethylenimine, $\text{CH}_2=\text{NCH}_3$, and *C*-methyl-methylenimine, $\text{CH}_3\text{CH}=\text{NH}$, J. Electron Spectrosc. Relat. Phenom. **14**, 379 (1978).
- [4777] Egdell, R. G., Fragala, I., and Orchard, A. F. UV photoelectron spectra of the indium(I) and thallium(I) cyclopentadienides, J. Electron Spectrosc. Relat. Phenom. **14**, 467 (1978).
- [4778] Vonbacho, P. S., Saltsburg, H., and Caesar, G. P. The photoelectron spectra of gaseous silver halides, J. Electron Spectrosc. Relat. Phenom. **8**, 359 (1976).
- [4779] Müller, C., Schweig, A., Thiel, W., Grahn, W., Bergman, R. G., and Vollhardt, K. P. C. Photoelectron spectra of 2,5-dehydrotropylidene, 3,6-dehydrooxepin, and fulvenallene, J. Am. Chem. Soc. **101**, 5579 (1979).
- [4780] Nelsen, S. F., Peacock, V. E., Weisman, G. R., Landis, M. E., and Spencer, J. A. Conformations of fourmembered ring

- hydrazines and hydrazine radical cations, *J. Am. Chem. Soc.* **100**, 2806 (1978).
- [4781] Houk, K. N., Strozier, R. W., Santiago, C., Gandour, R. W., and Vollhardt, K. P. C. Electronic structure and photoelectron spectrum of 1,5,9-cyclododecatriene, *J. Am. Chem. Soc.* **101**, 5183 (1979).
- [4782] Sandman, D. J., Ceasar, G. P., Nielsen, P., Epstein, A. J., and Holmes, T. J. Electronic structure of the π donor naphthalene 1,8-disulfide, *J. Am. Chem. Soc.* **100**, 202 (1978).
- [4803] Overman, L. E., Taylor, G. F., Houk, K. N., and Domelsmith, L. N. Diels-Alder reactions between *trans*-1-N-acylamino-1,3-dienes and methyl acrylate. A correlation between diene photoelectron ionization potentials and reactivity, stereoselectivity, and regioselectivity, *J. Am. Chem. Soc.* **100**, 3182 (1978).
- [4804] Koenig, T., Wielesek, R., Miller, L. L., and So, Y.-H. Correlation of electrochemical reactivity and photoelectron spectra of aromatic ketones, *J. Am. Chem. Soc.* **99**, 7061 (1977).
- [4805] Novak, I., Klasinc, L., and Knop, J. V. Photoelectron spectroscopy of heterocycles. Dipyrindylethylenes, *Z. Naturforsch.* **32a**, 886 (1977).
- [4806] Vick, D. O., Woodley, D. G., Bloor, J. E., Allen, J. D., Jr., Mui, T. C., and Schweitzer, G. K. The photoelectron spectra of gaseous alkali perhenates, *J. Electron Spectrosc. Relat. Phenom.* **13**, 247 (1978).
- [4807] Stockbauer, R., and McCulloh, K. E., and Parr, A. C. The ionization potential of allene, *Intern. J. Mass Spectrom. Ion Phys.* **31**, 187 (1979).
- [4808] Schang, P., Gleiter, R., and Rieker, A. The He(I) photoelectron spectrum of cyclobutene-1,2-dione and *o*-benzoquinone, *Ber. Bunsenges. Phys. Chem.* **82**, 629 (1978).
- [4809] Day, J. S., Gowenlock, B. G., Johnson, C. A. F., McNally, I. D., and Pfab, J. Appearance potential studies of some geminal substituted C-nitroso compounds, *J. Chem. Soc. Perkin Trans. II* **10**, 1110, (1978).
- [4810] Worley, S. D., Gerson, S. H., Bodor, N., Kaminski, J. J., and Flechtner, T. W. On the structure of N-chlorosuccinimide and N-bromosuccinimide. A photoelectron spectroscopic study, *J. Chem. Phys.* **68**, 1313 (1978).
- [4811] Ulman, J. A., Andersen, E. L., and Fehlner, T. P. Characterization of ferraboranes by ultraviolet photoelectron spectroscopy, *J. Am. Chem. Soc.* **100**, 456 (1978).
- [4812] Palmer, M. H., Leaver, D., Nisbet, J. D., Millar, R. W., and Egdell, R. The electronic structure of some heterocycles with bridgehead nitrogen: photoelectron spectra and ab initio molecular orbital calculations, *J. Mol. Struct.* **42**, 85 (1977).
- [4813] Streets, D. G., and Berkowitz, J. Electronic structures of fulvalene and octachlorofulvalene, *Chem. Phys.* **23**, 79 (1977).
- [4814] Vocelle, D., Dargelos, A., Pottier, R., and Sandorfy, C. Photoelectron and far-ultraviolet absorption spectra of nonaromatic azomethine compounds, *J. Chem. Phys.* **66**, 2860 (1977).
- [4815] Prins, I., Verhoeven, J. W., DeBoer, Th. J., and Worrell, C. Conformational studies on arylcyclopropanes-I, *Tetrahedron* **33**, 127 (1977).
- [4816] Heilbronner, E., Jones, T. B., Kloster-Jensen, E., and Maier, J. P. 191. Electronic states of di-*t*-butylpolyacetylene radical cations, *Helv. Chim. Acta* **61**, 2040 (1978).
- [4817] Potts, A. W. The valence electronic structure of SeO₂ studied by UPS and its relation to that of other group VIB dioxides, *J. Electron Spectrosc. Relat. Phenom.* **11**, 157 (1977).
- [4818] Peel, J. B., and Willett, G. D. Photoelectron spectroscopic studies of the propyl- and allyl- substituted amines, *Aust. J. Chem.* **30**, 2571 (1977).
- [4819] Domelsmith, L. N., and Houk, K. N. Photoelectron spectra of cyclopentanone and cyclohexanone enamines, *Tetrahedron Letters* **23**, 1981 (1977).
- [4820] Koenig, T., and Chang, J. C. Helium(I) photoelectron spectrum of tropyl radical, *J. Am. Chem. Soc.* **100**, 2240 (1978).
- [4821] Bastide, J., Hall, D., Heilbronner, E., and Maier, J. P. He(I α) photoelectron spectra of some higher aromatic perfluoro compounds, *J. Electron Spectrosc. Relat. Phenom.* **16**, 205 (1979).
- [4822] Bancroft, G. M., Coatsworth, L. L., Creber, D. K., and Tse, J. High Resolution gas phase photoelectron spectra of core *d* levels using He II radiation, *Physica Scripta* **16**, 217 (1977).
- [4823] Hammer, C. A., Allen, J. D., Jr., Cusachs, L. C., and Schweitzer, G. K. The high-temperature photoelectron spectra of alkaline-earth chlorides and iodides, *J. Electron Spectrosc. Relat. Phenom.* **13**, 149 (1978).
- [4824] Reingold, I. D., Schmidt, W., and Boekelheide, V. Syntheses, properties, and photoelectron spectra of substituted and layered [2.2](2,6)pyridinoparacyclophanes, *J. Am. Chem. Soc.* **101**, 2121 (1979).
- [4825] Downs, A. J., Egdell, R. G., Orchard, A. F., and Thomas, P. D. P. Photoelectron spectra of metal tetrahydroborates, *J. Chem. Soc. Dalton Trans.* **12**, 1755 (1978).
- [4826] Evans, S., and Orchard, A. F. The vapour-phase ultra-violet photoelectron spectroscopy of metal halides at elevated temperatures, *J. Electron Spectrosc. Relat. Phenom.* **6**, 207 (1975).
- [4827] Solouki, B., Bock, H., and Appel, R. Photoelektronenspektren und Moleküleigenschaften, XLV Schwefelsäure-Derivate X₂SY₂: Alkyl-, Vinyl- und Arylsulfone, Alkylsulfoimide und Sulfurylhalogenide, *Chem. Ber.* **108**, 897 (1975).
- [4828] Heilbronner, E., Hoshi, T., von Rosenberg, J. L., and Hafner, K. Alkyl-induced, natural hypsochromic shifts of the ²A \leftarrow ³X and ²B \leftarrow ²X transitions of azulene and naphthalene radical cations, *Nouveau Journal de Chimie*, **1**, 105 (1976).
- [4829] Delwiche, J., Praet, M.-Th., Caprace, G., Franksin-Hubin, M.-J., Natalis, P., and Collin, J. E. The HeI photoelectron spectra of methyl-substituted 1,2,4-pentatrienes (vinylallene), *J. Electron Spectrosc. Relat. Phenom.* **16**, 35 (1979).
- [4830] Morishima, I., Yoshikawa, K., Hashimoto, M., and Bekki, K. Homoallylic interaction between the nitrogen lone pair and the nonadjacent π bond in cyclic and bicyclic amines. I. Photoelectron spectroscopic study, *J. Am. Chem. Soc.* **97**, 4283 (1975).
- [4831] Benoit, F. M., Harrison, A. G., and Lossing, F. P. Hydrogen migrations in mass spectrometry III- Energetics of formation of [R'CO₂H₂]⁺ in the mass spectra of R'CO₂R, *Organic Mass Spectrom.* **12**, 78 (1977).
- [4832] Christoph, G. G., Muthard, J. L., Paquette, L. A., Böhm, M. C., and Gleiter, R. Quantitative assessment of pp- σ overlap in a topologically convex triene. Electronic and crystal structure analysis of C₁₆-hexaquinacene, *J. Am. Chem. Soc.* **100**, 7782 (1978).
- [4833] Domelsmith, L. N., Houk, K. N., Piedrahita, C., and Dolbier, W. J., Jr. The photoelectron spectrum of 1,1-difluoroallene. On π electron donation and withdrawal by fluorine, *J. Am. Chem. Soc.* **100**, 6908 (1978).
- [4834] Baldwin, M. A., Loudon, A. G., Maccoll, A., and Webb, K. S. The nature and fragmentation pathways of the molecular ions of some arylureas, arylthiureas, acetanilides, thioacetanilides and related compounds, *Org. Mass Spectrom.* **11**, 1181 (1976).
- [4835] Ku, A. Y., Paquette, L. A., Rozeboom, M. D., and Houk, K. N. Polar effects on di- π -methane rearrangements,

- Regiospecificity in the triplet-sensitized photoisomerizations of 2-cyanobenzonorbornadienes carrying methoxy aryl substituents, *J. Am. Chem. Soc.* **101**, 5981 (1979).
- [4836] Kroto, H. W., Nixon, J. F., Simmons, N. P. C., and Westwood, N. P. C. $\text{FC}\equiv\text{P}$, *C*-fluorophosphaethyne: Preparation and detection by photoelectron and microwave spectroscopy, *J. Am. Chem. Soc.* **100**, 446 (1978).
- [4837] Poole, R. T., Nicholson, J. A., Jenkin, J. G., Leckey, R. C. G., Peel, J. B., and Liesegang, J. Electronic structure of the valence bands of SnCl_2 and SnBr_2 studied by ultraviolet photoelectron spectroscopy, *J. Electron Spectrosc. Relat. Phenom.* **15**, 91 (1979).
- [4838] Müller, C., Schweig, A., Cava, M. P., and Lakshmikantham, M. V. Thieno[3,4-*c*]thiophenes. Electronic structure, *J. Am. Chem. Soc.* **98**, 7187 (1976).
- [4839] Potts, A. W., and Lyus, M. L. The photoelectron spectrum and valence shell structure of $(\text{CuX})_3$ and $(\text{AgCl})_3$, *J. Electron Spectrosc. Relat. Phenom.* **13**, 305 (1978).
- [4840] Bowling, R. A., Allen, J. D., Jr., and Schweitzer, G. K. The He(I) photoelectron spectra of gaseous alkali metaphosphates, *J. Electron Spectrosc. Relat. Phenom.* **17**, 25 (1979).
- [4841] Colonna, F. P., Distefano, G., and Galasso, V. Photoelectron spectra of 1,4-dithiin and related compounds, *J. Electron Spectrosc. Relat. Phenom.* **18**, 75 (1980).
- [4842] Brown, R. S., and Marcinko, R. W. Influence of substituents upon ionization potential. Dependence of the π -ionization energy on the orientation of an allylic hydroxyl or methoxyl substituent, *J. Am. Chem. Soc.* **100**, 5721 (1978).
- [4843] Kibel, M. H., and Nyberg, G. L. Angular distribution valence photoelectron spectra of nitric oxide, *J. Electron Spectrosc. Relat. Phenom.* **17**, 1 (1979).
- [4844] McAlduff, E. J., and Bunbury, D. L. Photoelectron spectra of some aromatic mono- and di-ketones, *J. Electron Spectrosc. Relat. Phenom.* **17**, 81 (1979).
- [4845] Campbell, M. J., Liesegang, J., Riley, J. D., Leckey, R. C. G., Jenkin, J. G., and Poole, R. T. The electronic structure of the valence bands of solid NH_3 and H_2O studied by ultraviolet photoelectron spectroscopy, *J. Electron Spectrosc. Relat. Phenom.* **15**, 83 (1979).
- [4846] Jones, T. B., and Maier, J. P. Study of the radical cation of all *trans*-1,3,5,7-octatetraene by its emission, $\text{A}^2\text{A}_g \rightarrow \text{X}^2\text{B}_g$, and by photoelectron spectroscopy, *Intern. J. Mass Spectrom. Ion Phys.* **31**, 287 (1979).
- [4847] Andreocci, M. V., Bitchev, P., Carusi, P., and Furlani, A. Valence shell photoionization spectra of some substituted hydroxy-acetylenes. A tentative correlation with their cyclotrimerization reactions, *J. Electron Spectrosc. Relat. Phenom.* **16**, 25 (1979).
- [4848] Bernardi, F., Danieli, R., Distefano, G., Modelli, A., and Ricci, A. Photoelectron spectra of substituted dialkylphenylthioboranes, *J. Organometal. Chem.* **136**, 161 (1977).
- [4849] Bartetzko, R., Gleiter, R., Muthard, J. L., and Paquette, L. A. Long range electronic transmission in conformationally rigid α -diketones, *J. Am. Chem. Soc.* **100**, 5589 (1978).
- [4850] Benoit, F. M., and Harrison, A. G. Predictive value of proton affinity. Ionization energy correlations involving oxygenated molecules, *J. Am. Chem. Soc.* **99**, 3980 (1977).
- [4851] Dougherty, D., Blankespoor, R. L., and McGlynn, S. P. Photoelectron spectroscopy of carbonyls. Bicyclo [2.2.1]-heptane-2,3-diones and bicyclo[2.2.1] hept-5-ene-2,3-diones, *J. Electron Spectrosc. Relat. Phenom.* **16**, 245 (1979).
- [4852] Clar, E., and Schmidt, W. Correlations between photoelectron and ultraviolet absorption spectra of polycyclic hydrocarbons. The terylene and peropyrene series, *Tetrahedron* **34**, 3219 (1978).
- [4853] Cradock, S., and Duncan, W. Photoelectron spectra of cyclopentadienyl derivatives of mercury, thallium, indium, tin and lead, *J. Chem. Soc. Faraday Trans. II* **74**, 194 (1978).
- [4854] Distefano, G., Jones, D., Colonna, F. P., Bigotto, A., Galasso, V., Pappalardo, G. C., and Scarlata, G. Evidence from the ultraviolet photoelectron and x-ray photoelectron spectra of phthalimide, quinolinimide, and their *N*-methyl derivatives regarding the prevailing tautomeric form of quinolinimide, *J. Chem. Soc. Perkin II*, 441 (1978).
- [4855] Domelsmith, L. N., Houk, K. N., Degenhardt, C. R., and Paquette, L. A. Photoelectron spectra and orbital interactions in methyleneortriquinacenes, *J. Am. Chem. Soc.* **100**, 100 (1978).
- [4856] Müller, C., Schweig, A., and Vermeer, H. Photoelectron spectra of 1,2-diphenylcyclopropene, 2,3-diphenylcyclopropenone, 2,3-diphenylcyclopropenethione, 2,3-diphenylthiirene 1-oxide, and *cis*-stilbene. An experimental verification of conjugative and inductive interactions, *J. Am. Chem. Soc.* **100**, 8056 (1978).
- [4857] Kirby, C., Kroto, H. W., and Westwood, N. P. C. Detection of chlorothioborane, $\text{ClB}=\text{S}$, a new unstable triatomic molecule, by photoelectron and microwave spectroscopy, *J. Am. Chem. Soc.* **100**, 3766 (1978).
- [4858] Dyke, J. M., Fayad, N. K., Morris, A., and Trickle, I. R. Gas-phase He I photoelectron spectra of some transition metals: Cu, Ag, Au, Cr and Mn, *J. Phys. B.* **12**, 2985 (1979).
- [4859] Houk, K. N., and Munchausen, L. L. Ionization potentials, electron affinities, and reactivities of cyanoalkenes and related electron-deficient alkenes. A frontier molecular orbital treatment of cyanoalkene reactivities in cycloaddition, electrophilic, nucleophilic, and radical reactions, *J. Am. Chem. Soc.* **98**, 937 (1976).
- [4860] Hildenbrand, D. L. Dissociation energies of CaBr , SrBr , BaBr , and BaCl from mass spectrometric studies of gaseous equilibria, *J. Chem. Phys.* **66**, 3526 (1977).
- [4861] Gleiter, R., Schang, P., and Seitz, G. Photoelectron spectra of cyclobutene-1,2-dione derivatives, *Chem. Phys. Letters* **55**, 144 (1978).
- [4862] Hsieh, T., and Hanrahan, R. J. An electron impact investigation of pentafluoroethyl iodide, *Int. J. Mass Spectrom. Ion Phys.* **23**, 201 (1977).
- [4863] Hansen, P. E., and Undheim, K. Mass spectrometry of onium compounds. XXIX. Ionisation potential in structure analysis of valence isomers, *Acta Chem. Scand.* **B29**, 221 (1975).
- [4864] Hildenbrand, D. L. Thermochemical studies of the gaseous lower-valent fluorides of molybdenum, *J. Chem. Phys.* **65**, 614 (1976).
- [4865] Hildenbrand, D. L. Thermochemistry of gaseous UF_5 and UF_4 , *J. Chem. Phys.* **66**, 4788 (1977).
- [4866] Domelsmith, L. N., Mollere, P. D., Houk, K. N., Hahn, R. C., and Johnson, R. P. Photoelectron and charge transfer spectra of benzobicycloalkenes. Relationships between through-space interactions and reactivity, *J. Am. Chem. Soc.* **100**, 2959 (1978).
- [4867] Utsunomiya, C., Kobayashi, T., and Nagakura, S. Photoelectron angular distribution measurements for some pyridines, *Bull. Chem. Soc. Jpn.* **51**, 3482 (1978).
- [4868] Corderman, R. R., LeBreton, P. R., Buttrill, S. E., Jr., Williamson, A. D., and Beauchamp, J. L. Photoionization and ion cyclotron resonance studies of the ion chemistry of ethylene oxide, *J. Chem. Phys.* **65**, 4929 (1976).
- [4869] Kordis, J., and Gingerich, K. A. Mass spectrometric observations of some polyatomic gaseous rare earth oxides and their atomization energies, *J. Chem. Phys.* **66**, 483

- (1977).
- [4870] Smith, R. D., Wyatt, J. R., DeCorpo, J. J., Saalfeld, F. E., Moran, M. J., and MacDiarmid, A. G. Identification of the vapor phase species of (SN)_x, Chem. Phys. Letters **41**, 362 (1976).
- [4871] Schweitzer, G. K., McMurtrie, A. C., Allen, J. D., Jr., Cusachs, L. C., Vick, D. O., and Finkelstein, G. The photoelectron spectra of some gaseous thallium (I) oxyanion salts, J. Electron Spectrosc. Relat. Phenom. **10**, 155 (1977).
- [4872] Hildenbrand, D. L. Dissociation energy of samarium monoxide and its relation to that of europium monoxide, Chem. Phys. Letters **48**, 340 (1977).
- [4873] Simmons, L. L., Lowden, L. F., and Ehlert, T. C. A mass spectrometric study of K₂CO₃ and K₂O, J. Phys. Chem. **81**, 706 (1977).
- [4874] Smoes, S., Drowart, J., and Welter, J. M. Thermodynamic study of the vaporization of europium sulfide by the mass spectrometric Knudsen cell method, Adv. Mass. Spectrom. **7A**, 622 (1978).
- [4875] Simmons, L. L., Lowden, L. F., and Ehlert, T. C. A mass spectrometric study of potassium cyanide, J. Phys. Chem. **81**, 709 (1977).
- [4876] Suzuki, I. H., and Maeda, K. Ionization efficiency curves of acetylene by electron impact, Mass Spectroscopy **25**, 223 (1977).
- [4877] Sahini, V. E., Constantin, V., and Serban, I. Determination of ionization potentials using a MI-1305 mass spectrometer, Rev. Roum. Chim. **23**, 479 (1978).
- [4878] Loudon, A. G., and Webb, K. S. The nature of the [C₂H₆N]⁺ and [CH₃N]⁺ ions formed by electron impact on methylated formamides, acetamides, ureas, thioureas and hexamethylphosphoramide, Org. Mass Spectrom. **12**, 283 (1977).
- [4879] Foner, S. N., and Hudson, R. L. Mass spectrometry of excited state molecules: Observation of highly vibrationally excited HF by ionization potential measurement, J. Chem. Phys. **68**, 2987 (1978).
- [4880] Bunzli, J. C., Frost, D. C., Herring, F. G., and McDowell, C. A. Assignment of the doublet states arising from ionization of chlorine lone-pairs in molecules possessing C_{2v} symmetry, J. Electron Spectrosc. Relat. Phenom. **9**, 289 (1976).
- [4881] Farber, M., and Srivastava, R. D. The dissociation energies of calcium oxide and strontium oxide, High Temp. Sci. **8**, 73 (1976).
- [4882] Green, J. C., Seddon, E. A., and Mingos, D. M. P. U.V. photoelectron spectral studies on the metal carbonyl cluster compounds Os₃(CO)₁₂, Ru₃(CO)₁₂, and Os₆(CO)₁₈, J. Chem. Soc. Chem. Commun. **94** (1979).
- [4883] Colbourn, E. A., Dyke, J. M., Fackerell, A., Morris, A., and Trickle, I. A. Vacuum ultraviolet photoelectron spectrum of the GeO(X¹Σ⁺) molecule, J. Chem. Soc., Faraday Trans. II, 2278 (1978).
- [4884] Kobayashi, T. A simple general tendency in photoelectron angular distributions of some monosubstituted benzenes, Phys. Letters **69A**, 105 (1978).
- [4885] Dehmer, P. M., and Dehmer, J. L. Photoelectron spectra of Ar₂ and Kr₂ and dissociation energies of the rare gas dimer ions, J. Chem. Phys. **69**, 125 (1978).
- [4886] Eland, J. H. D., and Berkowitz, J. Formation and predissociation of CO₂⁺(C²Σ_g⁺), J. Chem. Phys. **67**, 2782 (1977).
- [4887] Klasinc, L., Kovač, B., Schoof, S., and Güsten, H. Photoelectron spectroscopy of 9-substituted anthracenes, Croat. Chem. Acta. **51**, 307 (1978).
- [4888] Downs, A. J., Egdel, R. G., Orchard, A. F., and Thomas, P. D. P. Photoelectron spectra of metal tetrahydroborates, J. Chem. Soc. Dalton Trans. 1755 (1978).
- [4889] Bigotto, A., Galasso, V., Colonna, F. P., Distefano, G., Pappalardo, G. C., and Scarlata, G. Electronic structure and photophysical properties of quinolinic anhydride, quinolinic thioanhydride, and N-methylquinolinimide, J. Chem. Soc. Perkins II **11**, 1194 (1978).
- [4890] Cvitaš, T., and Klasinc, L. Photoelectron spectra of bromobenzenes, Croat. Chem. Acta. **50**, 291 (1977).
- [4891] Palmer, M. H., Moyes, W., Speirs, M., and Ridyard, J. N. A. The electronic structure of substituted benzenes; ab initio calculations and photoelectron spectra for phenol, the methyl- and fluoro-derivatives, and the dihydroxybenzenes, J. Mol. Struct. **52**, 293 (1979).
- [4892] Palmer, M. H., Moyes, W., Spiers, M., and Ridyard, J. N. A. The electronic structure of substituted benzenes; ab initio calculations and photoelectron spectra for nitrobenzene, the nitrotoluenes, dinitrobenzenes and fluoronitrobenzenes, J. Mol. Struct. **55**, 243 (1979).
- [4893] Palmer, M. H., Moyes, W., Spiers, M., and Ridyard, J. N. A. The electronic structure of substituted benzenes; a study of aniline, the toluidines, phenylenediamines and fluoroanilines by photoelectron spectroscopy and ab initio calculations, J. Mol. Struct. **53**, 235 (1979).
- [4894] Farber, M., and Srivastava, R. D. Mass spectrometric determination of the heats of formation of the silane fluorides, Chem. Phys. Letters **51**, 307 (1977).
- [4895] Lossing, F. P., and Maccoll, A. Free radicals by mass spectrometry, XLVII. Ionization potentials and ionic heats of formation of C₅-C₇ alkyl radicals, Can. J. Chem. **54**, 990 (1976).
- [4896] Willis, C., Lossing, F. P., and Back, R. A. The heat of formation of N₂H₂ and the proton affinity of N₂, Can. J. Chem. **54**, 1 (1976).
- [4897] Hubin-Franskin, M.-J., Loch, R., and Katiwabwa, J. Dissociative ionization of carbon disulphide in the gas phase. Heat of formation of the CS radical, Chem. Phys. Letters **37**, 488 (1976).
- [4898] Houle, F. A., and Beauchamp, J. L. Detection and investigation of allyl and benzyl radicals by photoelectron spectroscopy, J. Am. Chem. Soc. **100**, 3290 (1978).
- [4899] Houle, F. A., and Beauchamp, J. L. Photoelectron spectroscopy of methyl, ethyl, isopropyl, and *tert*-butyl radicals. Implications for the thermochemistry and structures of the radicals and their corresponding carbonium ions, J. Am. Chem. Soc. **101**, 4067 (1979).
- [4900] Gupta, S. K., and Gingerich, K. A. Mass spectrometric observation and dissociation energy of the gaseous molecule MoNb, J. Chem. Phys. **69**, 4318 (1978).
- [4901] Smoes, S., Pattje, W. R., and Drowart, J. Thermodynamic study of the vaporization of manganese metal and manganese selenide by Knudsen-cell mass spectrometry, High Temp. Sci. **10**, 109 (1978).
- [4902] Fries, J. A., and Cater, E. D. Vaporization, thermodynamics, and dissociation energy of gadolinium monosulfide: Systematics of vaporization of the rare earth monosulfides, J. Chem. Phys. **68**, 3978 (1978).
- [4903] Foner, S. N., and Hudson, R. L. Determination of the proton affinity of N₂ from ionization data on *trans*-diimide, J. Chem. Phys. **68**, 3169 (1978).
- [4904] Foner, S. N., and Hudson, R. L. On the heat of formation of diimide, J. Chem. Phys. **68**, 3162 (1978).
- [4905] Hubin-Franskin, M. J., Huard, D., and Marmet, P. On the heat of formation of CS from CS₂ and OCS, Int. J. Mass Spectrom. Ion Phys. **27**, 263 (1978).
- [4906] Kaposi, O., Popović, A., and Marsel, J. Mass spectrometric studies of tungsten bromides and oxybromides, J. Inorg. Nucl. Chem. **39**, 1809 (1977).
- [4907] Murphy, M. K., and Beauchamp, J. L. Photoionization mass spectrometry of the fluoromethylsilanes (CH₃)_nF_{4-n}Si (n = 1-4), J. Am. Chem. Soc. **99**, 2085 (1977).
- [4908] Van Dam, H., and Oskam, A. He(I) and He(II) photoelectron spectra of iron tetracarbonyl-olefin complexes, J. Electron

- [4909] Gingerich, K. A., and Gupta, K. A. Dissociation energies of the molecules RhTh and RhU from high temperature mass spectrometry and predicted thermodynamic stabilities of selected diatomic actinide-platinum metal intermetallic molecules, *J. Chem. Phys.* **69**, 505 (1978).
- [4910] Batten, C. F., Taylor, J. A., and Meisels, G. G. Photoionization processes at threshold. I. Threshold photoelectron and photoionization spectra of CO₂, *J. Chem. Phys.* **65**, 3316 (1976).
- [4911] Suzuki, I. H., and Maeda, K. Ionization efficiency curves of ethane by electron impact, *Intern. J. Mass Spectrom. Ion Phys.* **24**, 147 (1977).
- [4912] Zmbov, K. F., Wu, C. H., and Ihle, H. R. A mass spectrometric study of heteronuclear diatomic alkali metal molecules. Dissociation energies and ionization potentials of NaLi, KLi, and NaK, *J. Chem. Phys.* **67**, 4603 (1977).
- [4913] Schmidt, W. Photoelectron spectra of polynuclear aromatics. V. Correlations with ultraviolet absorption spectra in the catacondensed series, *J. Chem. Phys.* **66**, 828 (1977).
- [4914] Herrmann, A., Leutwyler, S., Schumacher, E., and Wöste, L. 38. On metal-atom clusters IV. Photoionization thresholds and multiphoton ionization spectra of alkali-metal molecules, *Helv. Chim. Acta* **61**, 453 (1978).
- [4915] Lossing, F. P. Heats of formation of some isomeric [C_nH_{2n+1}O]⁺ ions. Substitutional effects on ion stability, *J. Am. Chem. Soc.* **99**, 7526 (1977).
- [4916] Jadrny, R., Karlsson, L., Mattsson, L., and Siegbahn, K. Valence electron spectra of the chlorofluoromethanes CF₃Cl, CF₂Cl₂ and CFCl₃, *Physica Scripta* **16**, 235 (1977).
- [4917] Sasanuma, M., Ishiguro, E., Hayaisha, T., Masuko, H., Morioka, Y., Nakajima, T., and Nakamura, M. Photoionisation of SF₆ in the XUV region, *J. Phys. B* **12**, 4057 (1979).
- [4918] McDuff, E. J., Lynch, B. M., and Houk, K. N. Photoelectron spectra of substituted benzamides, *Can. J. Chem.* **56**, 495 (1978).
- [4919] Piacente, V., and Gingerich, K. A. The mass spectrometric determination of the dissociation energies of the molecules NaAu and NaAg, *High Temp. Sci.* **9**, 189 (1977).
- [4920] Tal'roze, V. L., Butkovskaya, N. I., Larichev, M. N., Leipunskii, I. O., Morozov, I. I., Dodonov, A. F., Kudrov, B. V., Zelenov, V. V., and Raznikov, V. V. Advances in the mass spectrometry of free radicals, *Advan. Mass Spectrom.* **7A**, 693 (1978).
- [4921] Sullivan, S. A., and Beauchamp, J. L. Positive and negative ion chemistry of sulfonyl halides, *Intern. J. Mass Spectrom. Ion Phys.* **28**, 69 (1978).
- [4922] Gordon, S. M., Harvey, G. A., Jackson, J. R., Tresling, J. D., and Van Niekerk, J. M. Computer-assisted retarding potential difference system for ionization efficiency measurements, *Intern. J. Mass Spectrom. Ion Phys.* **23**, 259 (1977).
- [4923] Ng, C. Y., Trevor, D. J., Mahan, B. H., and Lee, Y. T., Photoionization studies of the Kr₂ and Ar₂ van der Waals molecules, *J. Chem. Phys.* **66**, 446 (1977).
- [4924] Smets, J., Coppens, P., and Drowart, J. Photoionization with mass spectrometric analysis of the tetraphosphorus molecule, *Chem. Phys.* **20**, 243 (1977).
- [4925] Kuck, D., and Grützmacher, H. F. Hydrogen rearrangement in molecular ions of alkyl benzenes: appearance potentials and substituent effects on the formation of [C₇H₈]⁺ ions, *Org. Mass Spectrom.* **13**, 81 (1978).
- [4926] Ng, C. Y., Tiedemann, P. W., Mahan, B. H., and Lee, Y. T. Photoionization studies of the diatomic heteronuclear rare gas molecules XeKr, XeAr, and KrAr, *J. Chem. Phys.* **66**, 5737 (1977).
- [4927] Shudo, K., Kobayashi, T., and Utsunomiya, C. Photoelectron spectral studies on the interaction of three-membered rings with aryl groups, *Tetrahedron* **33**, 1721 (1977).
- [4928] McLoughlin, R. G., Morrison, J. D., and Traeger, J. C. A photoionization study of the [C₇H₈]⁺ ion formed from some monosubstituted alkyl benzenes, *Org. Mass Spectrom.* **13**, 483 (1978).
- [4929] Paine, A. J., and Werstiuk, N. H. SCF molecular orbitals and the photoelectron spectrum of 5,5-dimethyl-Δ¹-1,3,4-oxadiazolin-2-one, *Can. J. Chem.* **56**, 1319 (1978).
- [4930] Ng, C. Y., Trevor, D. J., Mahan, B. H., and Lee, Y. T. Photoionization study of the Xe₂ van der Waals molecule, *J. Chem. Phys.* **65**, 4327 (1976).
- [4931] Leng, F. J., and Nyberg, G. L. Angular-distribution He(I)/Ne(I) photoelectron spectra of allene, *J. Chem. Soc., Faraday Trans. II* **73**, 1719 (1977).
- [4932] Jones, G. G., and Taylor, J. W. A photoionization study of carbon dioxide dimers in a supersonic molecular beam, *J. Chem. Phys.* **68**, 1768 (1978).
- [4934] Van Der Greef, J., Molenaar-Langeveld, T. A., and Nibbering, N. M. M. The elimination of HCN (or HNC) from the molecular ions of some isomeric C₆H₇N compounds, studied by field ionization kinetic and kinetic energy release measurements, *Int. J. Mass Spectrom. Ion Phys.* **29**, 11 (1979).
- [4935] Rettig, W., and Wirz, J. 111. Electronic structure and photophysical properties of isoindole and its benzo[*f*]- and dibenzo[*e,g*]-derivatives, *Helv. Chim. Acta* **59**, 1054 (1976).
- [4936] Drowart, J., Smets, J., Reynaert, J. C., and Coppens, P. Mass spectrometric study of the photo-ionization of inorganic gases and vapours, *Adv. Mass Spectrom.* **7A**, 647 (1978).
- [4937] Ulman, J. A., Andersen, E. L., Fehlner, T. P. Characterization of ferraboranes by ultraviolet photoelectron spectroscopy, *J. Am. Chem. Soc.* **100**, 456 (1978).
- [4938] Santiago, C., Houk, K. N., DeCicco, G. J., Scott, L. T. The photoelectron and ultraviolet spectra of octamethylcyclododeca-1,3,7,9-tetrayne: a weakly antiaromatic molecule, *J. Am. Chem. Soc.* **100**, 692 (1978).
- [4939] Krause, D. A., Taylor, J. W., and Fenske, R. F. An analysis of the effects of alkyl substituents on the ionization potentials of *n*-alkenes, *J. Am. Chem. Soc.* **100**, 718 (1978).
- [4940] Gerson, S. H., Worley, S. D., Bodor, N., Kaminski, J. J., and Flechtner, T. W. The photoelectron spectra of some heterocyclic compounds which contain N, O, Cl and Br, *J. Electron Spectrosc. Relat. Phenom.* **13**, 421 (1978).
- [4941] Gerson, S. H., Worley, S. D., Bodor, N., and Kaminski, J. J. Electronic structures of some antimicrobial *N*-chloramines. Possible existence of intramolecular hydrogen bonding and its effect on germicidal efficiency, *J. Med. Chem.* **21**, 686 (1978).
- [4942] Cowley, A. H., Dewar, M. J. S., Lattman, M., Mills, J. L., McKee, M. An ultraviolet photoelectron spectroscopic-molecular orbital study of some cyclopolyposphines, *J. Am. Chem. Soc.* **100**, 3349 (1978).
- [4943] Carlier, J., and Botter, R. Photoelectron spectra of ethylene and of the six deuterated derivatives, *J. Electron Spectrosc. Relat. Phenom.* **17**, 91 (1979).
- [4944] Bulgin, D. K., Dyke, J. M., Jonathan, N., and Morris A. Vacuum ultraviolet photoelectron spectroscopy of transient species, *J. Chem. Soc. Faraday Trans. II* **75**, 456 (1979).
- [4945] Koenig, T., Imre, D., and Hoobler, J. A. He(I) photoelectron spectrum of benzocyclobutadiene, *J. Am. Chem. Soc.* **101**, 6446 (1979).
- [4946] Van Dam, H., and Oskam, A. A remeasurement of the UV photoelectron spectrum of Fe(CO)₅, ethylene, *J. Electron Spectrosc. Relat. Phenom.* **17**, 357 (1979).
- [4947] Nagy-Felsöbuki, E., Peel, J. B., and Willett, G. D. The

- photoelectron spectrum of bromamine, *J. Electron Spectrosc. Relat. Phenom.* **13**, 17 (1978).
- [4948] Nagy-Felsobuki, E., and Peel, J. B. The photoelectron spectra of unstable intermediates: Dibromamine, *J. Electron Spectrosc. Relat. Phenom.* **15**, 61 (1979).
- [4949] Ulman, J. A., and Fehlner, T. P. Ultraviolet photoelectron spectroscopy of boranes and carboranes. Five-, six-, and seven-atom frameworks, *J. Am. Chem. Soc.* **100**, 449 (1978).
- [4950] Potts, A. W., and Lee, E. P. F. Photoelectron spectra and electronic structure of lithium halide monomers and dimers, *J. Chem. Soc. Faraday Trans. II* **75**, 941 (1979).
- [4951] Carnovale, F., Gan, T. H., and Peel, J. B. Semi-empirical calculations and the assignment of valence photoelectron spectra of large molecules: phenalen-9-amino-1-imine., *J. Electron Spectrosc. Relat. Phenom.* **15**, 173 (1979).
- [4952] Santiago, C., Gandour, R. W., Houk, K. N., Nutakul, W., Cravey, W. E., and Thummel, R. P. Photoelectron and ultraviolet spectra of small-ring fused aromatic molecules as probes of aromatic ring distortions, *J. Am. Chem. Soc.* **100**, 3730 (1978).
- [4954] McAlduff, E. J., Caramella, P., and Houk, K. N., Photoelectron spectra of 3-substituted cyclopentenes. Correlations between ionization potentials and cycloaddition regioselectivity, *J. Am. Chem. Soc.* **100**, 105 (1978).
- [4955] Gassman, P. G., and Yamaguchi, R. Electrochemical oxidation of strained hydrocarbons, *J. Am. Chem. Soc.* **101**, 1308 (1979).
- [4956] Ramsey, B. G., and O'Neill, S. J. A comparison of modified CNDO/2 calculations and the photoelectron, NMR, and UV spectroscopic properties of boronsubstituted monophenylboranes, *J. Organometal. Chem.* **141**, 257 (1977).
- [4957] Berkowitz, J. Photoionization of CH_3OH , CD_3OH , and CH_3OD : Dissociative ionization mechanisms and ionic structures, *J. Chem. Phys.* **69**, 3044 (1978).
- [4958] Hille, E., and Märk, T. D. Cross section for single and double ionization of carbon monoxide by electron impact from threshold up to 180 eV, *J. Chem. Phys.* **69**, 4600 (1978).
- [4959] Akopyan, M. E., and Villem, Ya. Ya. Ion-molecule reactions in the photoionization of formic and acetic acid vapors, *High Energy Chem.* **10**, 24 (1976).
- [4960] Gross, M. L., Chiu, E., Pokorny, D., and DeRoos, F. L. Regiospecificity for water elimination. A mass spectral study of 1-tetralol and 2-tetralol, *Org. Mass Spectrom.* **12**, 55 (1977).
- [4961] Praet, M.-Th., Hubin-Franskin, M. J., Delwiche, J. P., and Schoos, R. Ionization and dissociation of C_6F_6 isomers under electron impact, *Organic Mass Spectrom.* **12**, 297 (1977).
- [4962] Nakato, Y., Abe, K., and Tsubomura, H. Experimental determination of ionization potentials of tetraphenylporphine and metallotetraphenylporphines, *Chem. Phys. Letters*, **39**, 358 (1976).
- [4963] Gleiter, R., Haider, R., Conia, J.-M., Barnier, J.-P., de Meijere, A., and Weber, W. Interaction of Walsh orbitals in rotanes. Photoelectron spectroscopic investigation, *J. Chem. Soc. Chem. Commun.* 130 (1979).
- [4964] Spanget-Larsen, J., Gleiter, R., Detty, M. R., and Paguette, L. A. Interaction of Walsh orbitals in trishomocycloheptatrienes and related hydrocarbons, *J. Am. Chem. Soc.* **100**, 3005 (1978).
- [4965] Brittain, H. G., Horozoglu, G., and Baker, A. D. The He(I) photoelectron spectra of some γ -substituted Co(III) acetylacetonate complexes, *J. Electron Spectrosc. Relat. Phenom.* **16**, 107 (1979).
- [4966] Smoes, S., and Drowart, J. Determination of the atomization energies of the molecules CSe(g) and $\text{CSe}_2(\text{g})$ by the mass spectrometric Knudsen cell method, *J. Chem. Soc., Faraday Trans. II* **73**, 1746 (1977).
- [4967] White, M. G., Rosenberg, R. A., Lee, S. T., and Shirley, D. A. The He(I) photoelectron spectroscopy of heavy group IV-VI diatomics, *J. Electron Spectrosc. Relat. Phenom.* **17**, 323 (1979).
- [4968] Worley, S. D., Taylor, K. G., Venugopalan, B., and Clark, M. S., Jr. Photoelectron spectra, reactions and structures of some acyclic 2-azadiene systems, *Tetrahedron* **34**, 833 (1978).
- [4969] Neijzen, B. J. M., and DeLange, C. A. Photoelectron spectroscopy of mono- and dicyanobenzenes and their perfluoro derivatives, *J. Electron Spectrosc. Relat. Phenom.* **14**, 187 (1978).
- [4970] Banna, M. S., and Shirley, D. A. Molecular photoelectron spectroscopy at 132.3 eV. The second-row hydrides, *J. Chem. Phys.* **63**, 4759 (1975).
- [4971] Holmes, J. L., and Osborne, A. D. Energy partitioning in the metastable fragmentation $[\text{C}_3\text{H}_3]^+ \rightarrow [\text{C}_3\text{H}_2]^+ + \text{H}_2$, *Org. Mass Spectrom.* **13**, 133 (1978).
- [4972] Roberge, R., Sandorfy, C., Matthews, J. I., and Strausz, O. P. The far ultraviolet and HeI photoelectron spectra of alkyl and fluorine substituted silane derivatives, *J. Chem. Phys.* **69**, 5105 (1978).
- [4979] Hubin-Franskin, M.-J., Delwiche, J., Natalis, P., Caprace, G., and Roy, D. On the photoelectron spectrum of CS_2 , *J. Elec. Spectrosc. Rel. Phenom.* **18**, 295 (1980).
- [4980] Brown, R. S., and Marcinko, R. W. Photoelectron spectra of the ozonides of ethylene, cyclopentene, and cyclohexene. Experimental evidence for the magnitude of the "pure" inductive effect of an ether oxygen on ionization energy, *J. Am. Chem. Soc.* **100**, 5584 (1978).
- [4981] MacNaughton, R. M., Allen, J. D., Jr., and Schweitzer, G. K. The He(I) photoelectron spectra of gaseous $(\text{CuCl})_3$, $(\text{CuBr})_3$, $(\text{AgCl})_3$, $(\text{AgBr})_3$, and $(\text{AgI})_3$, *J. Electron Spectrosc. Relat. Phenom.* **18**, 363 (1980).
- [4982] Schulz, R., and Schweig, A. 6-Fulveneselone, *Angew. Chem. Int. Ed.* **19**, 69 (1980).
- [4983] Ajö, D., Granozzi, G., Ciliberto, E., and Fragalà, I. Investigation of the electronic structure of 2-(acetylaminoprop-2-enoic acid (N-acetyldehydroalanine) by He^I and He^{II} photoelectron spectroscopy, *J. Chem. Soc. Perkins Trans. 2* 483, (1980).
- [4984] Bock, H., Boggs, J. E., Kleemann, G., Lentz, D., Oberhammer, H., Peters E. M., Seppelt, K., Simon, A., and Solouki, B. Structure and reactions of methylenesulfur tetrafluoride, *Angew. Chem. Int. Ed.* **18**, 944 (1979).
- [4985] Beltram, G., Fehlner, T. P., Mochida, K., and Kochi, J. K. UV photoelectron spectra of group IV alkyl hydrides, *J. Electron Spectrosc. Relat. Phenom.* **18**, 153 (1980).
- [4986] Coleman, A. W., Green, J. C., Hayes, A. J., Seddon, E. A., Lloyd, D. R., and Niwa, Y. A comparison of the electronic structure of some group 6a dimetal tetracarboxylates using photoelectron spectroscopy, *J. Chem. Soc. Dalton* **75**, 1057 (1979).
- [4987] Cauletti, C., Clark, J. P., Green, J. C., Jackson, S. E., Fragalà, I. L., Ciliberto, E., and Coleman, A. W. Photoelectron spectra of bis-cyclopentadienyl metal dihalides, *J. Electron Spectrosc. Relat. Phenom.* **18**, 61 (1980).
- [4988] Ebsworth, E. A. V., Rankin, D. W. H., and Wright, J. G. Preparation and chemical and spectroscopic properties of (disilylamino)-difluorophosphine and bis(difluorophosphino)silylamine, *J. Chem. Soc. Dalton Trans.* **6**, 1065 (1979).
- [4989] Vovna, V. I., Dudin, A. S., Avkhutskii, L. M., Lopatin, S. N., and Ippolitov, E. G. Photoelectron spectra and electronic spectra of volatile rhenium fluorides [and oxide fluorides], *Russ. J. Inorg. Chem.* **24**, 1135 (1979).
- [4990] Aue, D. H., Webb, H. M., Davidson, W. R., Vidal, M., Bowers, M. T., Goldwhite, H., Vertal, L. E., Douglas, J.

- E., Kollman, P. A., and Kenyon, G. L. Proton affinities and photoelectron spectra of three-membered-ring heterocycles, *J. Am. Chem. Soc.* **102**, 5151 (1980).
- [4991] Eland, J. H. D., and Berkowitz, J. Photoionization mass spectrometry of HI and DI at high resolution, *J. Chem. Phys.* **67**, 5034 (1977).
- [4992] Eweg, J. K., Müller, F., van Dam, H., Terpstra, A., and Oskam, A. He(I) and He(II) photoelectron spectra of alloxazines and isalloxazines, *J. Am. Chem. Soc.* **102**, 51 (1980).
- [4993] Dannacher, J., Schmelzer, A., Stadelmann, J.-P., and Vogt, J. A photoelectron-photoion coincidence study of vinylfluoride, *Intern. J. Mass Spectrom. Ion Phys.* **31**, 175 (1979).
- [4994] Frey, R., Gotchev, B., Peatman, W. B., Pollak, H., and Schlag, E. W. Photoionization resonance study of the $X(^2\Pi)$, $A(^2\Pi)$, $B(^2\Sigma^+)$ and $C(^2\Sigma^+)$ states of CS_2^+ and COS^+ *Intern. J. Mass Spectrom. Ion Phys.* **26**, 137 (1978).
- [4995] Guimon, C., Pfister-Guillouzo, G., and Mathey, F. Electronic structure of phosphacymantrene by photoelectron spectroscopy (He I, He II) and E.H.T. calculations, *Nouveau J. de Chimie* **3**, 725 (1979).
- [4996] Pesterev, V. I., Gabdrakipov, V. Z., Artyukhin, V. I., and Agashkin, O. V. The ionisation and excitation of the conformers of piperidine and its alkyl derivatives, *Russ. J. Phys. Chem.* **53**, 845 (1979).
- [4997] Batten, C. F., Taylor, J. A., Tsai, B. P., and Meisels, G. G. Photoionization processes at threshold. II. Threshold photoelectron, photoionization, and coincidence ion-threshold photoelectron spectra of BF_3 , *J. Chem. Phys.* **69**, 2547 (1978).
- [4998] Berkowitz, J., and Holloway, J. H. Photoionization mass spectrometric study of KrF_2 , *J. Chem. Soc. Faraday Trans. II* **74**, 2077 (1978).
- [4999] Garner, C. D., Hawskworth, R. W., Hillier, I. H., MacDowell, A. A., and Guest, M. F. Electronic structure of the transition-metal nitrates $Ti(NO_3)_3$, $VO(NO_3)_3$, $Co(NO_3)_2$, and $Cu(NO_3)_2$. Studied by low-energy photoelectron spectroscopy and ab initio molecular orbital and scattered wave-X α calculations, *J. Am. Chem. Soc.* **102**, 4325 (1980).
- [5000] Radler, K., and Berkowitz, J. Photoionization mass spectrometric study of CSe_2 , *J. Chem. Phys.* **66**, 2176 (1977).
- [5001] Frost, D. C., MacDonald, C. B., McDowell, C. A., and Westwood, N. P. C. The HeI photoelectron spectra of the halogen azides, XN_3 ($X=Cl$ and Br) and the halogen isocyanates, $XNCO$ ($X=Cl$, Br and I), *Chem. Phys.* **47**, 111 (1980).
- [5002] Colonna, F. P., Distefano, G., Guerra, M., and Jones, D. Photoelectron (He(I), He(II) and X-ray) spectroscopy of γ -pyrone and its related sulphur derivatives: valence and core ionization energies and shake-up satellites, *J. Electron Spectrosc. Relat. Phenom.* **18**, 309 (1980).
- [5003] Williamson, A. D., LeBreton, P. R., and Beauchamp, J. L. Photoionization mass spectrometry of 2-fluoropropane and 2,2-difluoropropane. A novel determination of the proton affinity of vinyl fluoride and 1,1-difluoroethylene, *J. Am. Chem. Soc.* **98**, 2705 (1976).
- [5004] Weiss, M. J., Berkowitz, J., and Appelman, E. H. Photoionization of ozone: Formation of O_4^+ and O_5^+ , *J. Chem. Phys.* **66**, 2049 (1977).
- [5005] Worley, S. D., Webb, T. R., Gibson, D. H., and Ong, T.-S. The photoelectron spectra of some iron tricarbonyl complexes of 4π -electron donor ligands, *J. Electron Spectrosc. Relat. Phenom.* **18**, 189 (1980).
- [5006] Huebner, R. H., Celotta, R. J., Mielczarek, S. R., and Kuyatt, C. E. Electron energy loss spectroscopy of acetone vapor, *J. Chem. Phys.* **59**, 5434 (1973).
- [5007] Appell, J., Durup, J., Fehsenfeld, F. C., and Fournier, P. Double charge transfer spectroscopy of diatomic molecules, *J. Phys. B* **6**, 197 (1973).
- [5008] Dyke, J. M., Jonathan, N. B. H., Morris, A., and Winter, M. J. The first ionization potential of the formyl radical, $HCO(X^2A)$, studied using photoelectron spectroscopy, *Mol. Phys.* **39**, 629 (1980).
- [5009] Parr, A. C., Jason, A. J., Stockbauer, R., and McCulloh, K. E. Photoionization and threshold photoelectron-photoion coincidence study of propyne from onset to 20 eV, *Intern. J. Mass Spectrom. Ion Phys.* **30**, 319 (1979).
- [5010] Worley, S. D., Webb, T. R., Gibson, D. H., and Ong, T.-S. On the electronic structures of cyclobutadiene and trimethylenemethane, *J. Organometal. Chem.* **168**, C16 (1979).
- [5011] Dunlavey, S. J., Dyke, J. M., Jonathan, N., and Morris, A. Vacuum ultraviolet photoelectron spectroscopy of transient species. Part 11. The $NH_2(X^2B_1)$ radical, *Mol. Phys.* **39**, 1121 (1980).
- [5012] Bock, H., Kaim, W., and Rohwer, H. E. Radical ions XI^+ . One-electron oxidation of alkylsilyl benzenes in the gas phase and in solution, *J. Organometal. Chem.* **135**, C14 (1977).
- [5013] Szepes, L., Distefano, G., and Pignataro, S. Steric inhibition of resonance in acetanilides by UV photoelectron spectroscopy, *Ann. Chim.* **64**, 159 (1974).
- [5014] Parr, A. C., Jason, A. J., and Stockbauer, R. Photoionization and threshold photoelectron-photoion coincidence study of cyclopropene from onset to 20 eV, *Int. J. Mass Spectrom. Ion Phys.* **33**, 243 (1980).
- [5015] Ng, C. Y., Trevor, D. J., Tiedemann, P. W., Ceyer, S. T., Kronebusch, P. L., Mahan, B. H., and Lee, Y. T. Photoionization of dimeric polyatomic molecules: proton affinities of H_2O and HF , *J. Chem. Phys.* **67**, 4235 (1977).
- [5016] Pabst, R. E., Sharpe, M. C., Margrave, J. L., and Franklin, J. L. An electron impact study of the appearance energies of positive ions from AsF_3 , $AsCl_3$, $AsBr_3$ and AsF_5 , *Int. J. Mass Spectrom. Ion Phys.* **33**, 187 (1980).
- [5017] Sell, J. A., and Kuppermann, A. Variable angle photoelectron spectroscopy of the fluoroethylenes, *J. Chem. Phys.* **71**, 4703 (1979).
- [5018] Wood, K. V., and Taylor, J. W. A photoionization mass spectrometric study of autoionization in ethylene and *trans*-2-butene, *Int. J. Mass Spectrom. Ion Phys.* **30**, 307 (1979).
- [5019] Santiago, C., McAlduff, E. J., Houk, K. N., Snow, R. A., and Paquette, L. A. Photoelectron spectra of ortho- and meta-substituted benzonorbornadienes. Relationships to regioselectivities in triplet di-methane rearrangements, *J. Am. Chem. Soc.* **100**, 6149 (1978).
- [5020] Gleiter, R., Hofmann, P., Schang, P., and Sieber, A. The orbital sequence in cyclic 1,3-diketones, *Tetrahedron* **36**, 655 (1980).
- [5021] Zverev, V. V., Villem, Y. Y., Ermolaeva, L. V., and Lisin, A. F. The photoelectron spectra and electronic structure of unsaturated phosphoryl compounds, *Doklady Akademii Nauk SSSR*, **246**, 1368 (1978).
- [5022] Freiser, B. S. Electron impact ionization of argon ions by trapped ion cyclotron resonance spectroscopy, *Int. J. Mass Spectrom. Ion Phys.* **33**, 263 (1980).
- [5023] Nagy-Felsobuki, E., and Peel, J. B. Photoelectron spectra of selenium dichloride and diselenium dichloride, *J. Chem. Soc. Faraday II*, **76**, 148 (1980).
- [5024] Bursten, B. E., Cotton, F. A., Green, J. C., Seddon, E. A., and Stanley, G. G. Electronic structures and photoelectron spectra of the metal atom cluster species Re_3Cl_n , Re_3Br_n , and $[Re_3Cl_{12}]^{+}$, *J. Am. Chem. Soc.* **102**, 955 (1980).
- [5025] Mead, P. T., Donchi, K. F., Traeger, J. C., Christie, J. R., and Derrick, P. J. Secondary hydrogen isotope effect in the

- unimolecular decomposition of 2-methylpropane radical cations, *J. Am. Chem. Soc.* **102**, 3364 (1980).
- [5026] Neijzen, B. J. M., and DeLange, C. A. Photoelectron spectroscopy of some thiocyanates, isocyanates and isothiocyanates, *J. Electron Spectrosc. Relat. Phenom.* **18**, 179 (1980).
- [5027] Huhin-Franskin, M.-J., Marmet, P., and Huard, D. Excitation and ionization of OCS and CS₂ by electron impact, *Int. J. Mass Spectrom. Ion Phys.* **33**, 311 (1980).
- [5028] Eland, J. H. D., Berkowitz, J., Schulte, H., and Frey, R. Rates of unimolecular pyridine ion decay and the heat of formation of C₅H₅⁺, *Int. J. Mass Spectrom. Ion Phys.* **28**, 297 (1978).
- [5029] Lee, L. C., Judge, D. L., and Ogawa, M. CS₂⁺(B²Σ_u⁺, A²Π_u → X²Π_g) fluorescence from photoionization excitation of CS₂ vapor, *Can. J. Phys.* **53**, 1861 (1975).
- [5030] Colbourne, D., Frost, D. C., McDowell, C. A., and Westwood, N. P. C. Dichloroketen; gas phase preparation and characterisation by photoelectron spectroscopy, *J. Chem. Soc. Chem. Comm.* 250, (1980).
- [5031] Nagy-Felsobuki, E., and Peel, J. B. Photoelectron spectra of sulfur dibromide and selenium dibromide, *Chem. Phys.* **45**, 189 (1980).
- [5032] Zverev, V. V., Villem, Ya. Ya., Bel'skii, V. E., and Kitaev, Yu. P. The photoelectronic spectra of phosphoryl compounds, *Izv. Akad. Nauk SSSR, Ser. Khim.* **1**, 84 (1979).
- [5033] Westwood, N. P. C., Kroto, H. W., Nixon, J. F., and Simmons, N. P. C. Formation of 1-phosphapropyne, CH₃C≡P, by pyrolysis of dichloro(ethyl)phosphine: a He(I) photoelectron spectroscopic study, *J. Chem. Soc. Dalton Trans.* **9**, 1405 (1979).
- [5034] Brogli, F., Heilbronner, E., Kloster-Jensen, E., Schmelzer, A., Manocha, A. S., Pople, J. A., and Radom, L. The photoelectron spectrum of butatriene, *Chem. Phys.* **4**, 107 (1974).
- [5035] Potts, A. W., and Price, W. C. Photoelectron studies of ionic materials using molecular beam techniques, *Physica Scripta* **16**, 191 (1977).
- [5036] Chisholm, M. H., Cowley, A. H., and Lattman, M. A UV photoelectron spectroscopic investigation of the bonding in some tri-, tetra-, and penta- coordinated dialkylamino compounds of chromium, molybdenum, niobium, and tantalum, *J. Am. Chem. Soc.* **102**, 46 (1980).
- [5037] Walker, T. E. H., Dehmer, P. M., and Berkowitz, J. Rotational band shapes in photoelectron spectroscopy: HF and DF, *J. Chem. Phys.* **59**, 4292 (1973).
- [5038] Jaudon, P., and Tabet, J.-C. Rearrangement of molecular ions following electron impact. IV-Origin of the [M-28]⁺ ions in the mass spectra of α-methyl-2- decalone, *Org. Mass Spectrom.* **15**, 65 (1980).
- [5039] Holmes, J. L., and Lossing, F. P. Gas-phase heats of formation of keto and enol ions of carbonyl compounds, *J. Am. Chem. Soc.* **102**, 1591 (1980).
- [5040] Evlasheva, T. I., Puchkova, V. V., Potapov, V. K., and Gur'yanova, E. N. Ionisation potentials and electron-donating properties of sulphones, *Russ. J. Phys. Chem.* **49**, 453 (1975).
- [5041] Johnson, K. M., Powis, I., and Danby, C. J. The fragmentation of COCl₂⁺ and COF₂⁺ ions studied by the photoelectron-photoion coincidence technique, *Int. J. Mass Spectrom. Ion Phys.* **32**, 1 (1979).
- [5042] Hodges, R. V., Houle, F. A., Beauchamp, J. L., Montag, R. A., and Verkade, J. G. Effects of molecular structure on basicity. Gas phase proton affinities of cyclic phosphites, *J. Am. Chem. Soc.* **102**, 932 (1980).
- [5043] Kovač, B., and Klasinc, L. Photoelectron spectroscopy of adamantane and some adamantanones, *Croat. Chem. Acta* **51**, 55 (1978).
- [5044] Connor, J. A., Derrick, L. M. R., Hall, M. B., Hillier, I. H., Guest, M. F., Higginson, B. R., and Lloyd, D. R. The electronic structure of transition metal complexes containing organic ligands 1. Low and high energy photoelectron spectra and ab initio SCF MO calculations of iron tricarbonyl butadiene, *Mol. Phys.* **28**, 1193 (1974).
- [5045] Parker, D. H., and El-Sayed, M. A. Determination of excited state lifetimes and ionization potentials by dual beam visible lasers, *Chem. Phys.* **42**, 379 (1979).
- [5046] Lefavre, D., and Marmet, P. Electroionization of D₂O and H₂O and study of fragments H⁺ and OH⁺, *Can. J. Phys.* **56**, 1549 (1978).
- [5048] Larzilliere, M., and Damany, N. Rydberg series of carbon disulfide converging to A²Π_u states of CS₂⁺, *Can. J. Phys.* **56**, 1150 (1978).
- [5049] Lagerqvist, A., and Renhorn, I. The spectrum of silicon monoxide (oxygen-18) in the vacuum ultraviolet region, *J. Mol. Spectrosc.* **19**, 157 (1974).
- [5050] Parr, A. C., Jason, A. J., and Stockbauer, R. Photoionization and threshold photoelectron-photoion coincidence study of allene from onset to 20eV, *Intern. J. Mass Spectrom. Ion Phys.* **26**, 23 (1978).
- [5051] Loch, R., Schopman, J., Wankenne, H., and Momigny, J. The dissociative ionization of nitrogen, *Chem. Phys.* **7**, 393 (1975).
- [5052] Lee, E. P. F., and Potts, A. W. The VUV photoelectron spectra of atomic In and Tl, *J. Electron Spectrosc. Relat. Phenom.* **19**, 65 (1980).
- [5053] Leupin, W., and Wirz, J. 161. Cyclooct-1-en-5-yne. Preparation, spectroscopic characteristics and chemical reactivity, *Helv. Chim. Acta* **61**, 1663 (1978).
- [5054] Poole, R. T., Orders, P. J., Jenkin, J. G., Leckey, R. C. G., and Liesegang, J. Electronic structure of the valence bands of SnF₂ studied by ultraviolet photoelectron spectroscopy, *Chem. Phys. Letters* **54**, 220 (1978).
- [5055] Potts, A. W., and Williams, T. A. The observation of "forbidden" transitions in He II photoelectron spectra, *J. Electron Spectrosc. Relat. Phenom.* **3**, 3 (1974).
- [5056] Paisner, J. A., Solarz, R. W., Worden, E. F., and Conway, J. G. IV. Highly excited states, ionization, and high intensity interactions, *Springer Series in Optical Sciences, Laser Spectroscopy III*, **7**, 160 (1977).
- [5058] Broer, W. J., Weringa, W. D., and Nieuwpoort, W. C. Rearrangements and fragmentations of [C₂H₅S]⁺ ions, *Org. Mass Spectrom.* **14**, 543 (1979).
- [5059] Helal, A. I., and Zahran, N. F. Kinetic shift in some *para*-substituted acetophenones, *Org. Mass Spectrom.* **13**, 549 (1978).
- [5060] Karlsson, L., Mattsson, L., Jadrny, R., Bergmark, T., and Siegbahn, K. Vibrational and vibronic structure in the valence electron spectrum of H₂S, *Physica Scripta* **13**, 229 (1976).
- [5061] Kingcade, J. E., Dufner, D. C., Gupta, S. K., and Gingerich, K. A. A thermodynamic study of the gaseous molecules CuSn₂ and Cu₂Sn, *High Temp. Sci.* **10**, 213 (1978).
- [5063] Kimura, K., and Osafune, K. Sum rule consideration on valence orbital ionization energies in methyl amines, *Mol. Phys.* **29**, 1073 (1975).
- [5064] Kronebusch, P. L., and Berkowitz, J. Photodissociative ionization in the 21-41 eV region: O₂, N₂, CO, NO, CO₂, H₂O, NH₃ and CH₄, *Int. J. Mass Spectrom. Ion Phys.* **22**, 283 (1976).
- [5066] Powis, I., and Danby, C. J. The unimolecular fragmentation of energy-selected acetone ions, *Int. J. Mass Spectrom. Ion Phys.* **32**, 27 (1979).
- [5067] Kleinschmidt, P. D., and Hildenbrand, D. L. Dissociation energies of CaI, SrI, and BaI from high temperature mass spectrometry, *J. Chem. Phys.* **68**, 2819 (1978).
- [5068] Kimura, K., and Osafune, K. Photoelectron spectroscopic study of skew compounds. III. *N,N'*-dimethylhydrazine,

- dimethyl peroxide, and dimethyl disulfide, *Bull. Chem. Soc. Japan* **48**, 2421 (1975).
- [5069] Traeger, J. C. Photoionization mass spectrometry of the propyl halides, *Int. J. Mass Spectrom. Ion Phys.* **32**, 309 (1980).
- [5070] Holmes, J. L., and Lossing, F. P. Keto and enol forms of methyl acetate molecular ions, their stability and interconvertibility prior to fragmentation in the gas phase, *Org. Mass Spectrom.* **14**, 512 (1979).
- [5071] Drury-Lessard, C. R., and Moule, D. C. The higher Rydberg states of formaldehyde, *Chem. Phys. Letters* **47**, 300 (1977).
- [5072] Holmes, J. L., Rye, R. T. B., and Terlouw, J. K. On the loss of ethylene from $[C_3H_5O]^+$ ions of structure CH_3CH_2CHOH , *Org. Mass Spectrom.* **14**, 606 (1979).
- [5073] De Leeuw, D. M., Mooyman, R., and De Lange, C. A. He(I) photoelectron spectroscopy of transient species: The SF_2 molecule, *Chem. Phys.* **34**, 287 (1978).
- [5074] De Leeuw, D. M., Mooyman, R., and De Lange, C. A. He(I) photoelectron spectroscopy of transient species: The SeX_2 molecules ($X=F, Cl$ and Br), *Chem. Phys.* **38**, 21 (1979).
- [5079] Lohr, W., Jochims, H. W., and Baumgartel, H. Photoreaktionen kleiner organischer Moleküle IV Absorptionsspektren, Photoionen- und Resonanz-photoelektronenspektren von Vinylbromid, *Ber. Bunsenges.* **79**, 901 (1975).
- [5080] Baldwin, M. A. Appearance energies and the kinetic shift. Loss of HCN from the benzonitrile molecular ion, *Org. Mass. Spectrom.* **14**, 601 (1979).
- [5081] Kaufman, V., and Hagan, L. Spectrum and energy levels of singly ionized aluminum (Al II), *J. Opt. Soc. Am.* **69**, 232 (1979).
- [5082] Lauer, G., Schäfer, W., and Schweig, A. Assignment of the four lowest ionized states of *p*-benzoquinone and the question of "lone pair splitting" in this system, *Chem. Phys. Letters* **33**, 312 (1975).
- [5083] Russell, D. H., Gross, M. L., Van der Greef, J., and Nibbering, N. M. M. The chemistry of C_6H_5O radical cations: A study of rearrangement reactions of halogen substituted ethyl phenyl ethers, *Org. Mass Spectrom.* **14**, 474 (1979).
- [5084] Bieri, G., and Åsbrink, L. 30.4-nm He(II) photoelectron spectra of organic molecules, *J. Electron Spectrosc. Relat. Phenom.* **20**, 149 (1980).
- [5085] Loudet, M., Grimaud, M., Metras, F., and PfisterGuillouzo, G. Interactions intramoléculaires en série cyclohexanique partie II. Spectres photoélectroniques de chloro-2 cyclohexanones, *J. Mol. Struct.* **35**, 213 (1976).
- [5086] Holmes, J. L., Terlouw, J. K., Vijhuizen, P. C., and A'Campo, C. Metastable ion studies XII-Molecular and fragment ion structures for isomeric $C_4H_6O_2$ acids, *Org. Mass Spectrom.* **14**, 204 (1979).
- [5087] De Leeuw, D. M., Mooyman, R., and De Lange, C. A. He(I) photoelectron spectroscopy of halogen atoms, *Chem. Phys. Letters* **54**, 231 (1978).
- [5088] Hoppilliard, Y., and Solgadi, D. Conformational analysis of 2-haloethanols and 2-methoxyethyl- halides in a photoelectron-spectrometer, *Tetrahedron* **36**, 377 (1980).
- [5089] Weidner, U., and Schweig, A. Evidence for conjugation through a saturated silicon atom, *Angew. Chem. Int. Ed.* **11**, 536 (1972).
- [5090] Dougherty, D., Brint, P., and McGlynn, S. P. Photoelectron spectroscopy of carbonyls. Lone-pair interactions in α -, β -, γ -, and δ -dicarbonyls, *J. Am. Chem. Soc.* **100**, 5597 (1978).
- [5091] Nelsen, S. F., Kessel, C. R., and Brien, D. J. Bredt's rule kinetically stabilized nitrogen- centered radical cations and radicals in the 9-azabicyclo[3.3.1]nonyl system, *J. Am. Chem. Soc.* **102**, 702 (1980).
- [5092] Ramsey, B. G. Substituent effects on imidazole basicity and photoelectron spectroscopy determined ionization energies, *J. Org. Chem.* **44**, 2093 (1979).
- [5093] Dougherty, D., Younathan, E. S., Voll, R., Abdunur, S., and McGlynn, S. P. Photoelectron spectroscopy of some biological molecules, *J. Electron Spectrosc. Relat. Phenom.* **13**, 379 (1978).
- [5094] Heilbronner, E., Jones, T. B., Krebs, A., Maier, G., Malsch, K. D., Pocklington, J., and Schmelzer, A. A photoelectron spectroscopic investigation of tetra-*tert*-butyltetrahydrene and of tetra-*tert*- butylcyclobutadiene, *J. Am. Chem. Soc.* **102**, 564 (1980).
- [5095] Bigotto, A., Galasso, V., Distefano, G., and Modelli, A. Photoelectron and electronic spectra of acenaphthenequinone, naphthalic anhydride, and naphthalimide, *J. Chem. Soc. Perkin II*, 1502 (1979).
- [5096] de Jong, A. P., and van Dam, H. Ultraviolet photoelectron spectroscopy of cyclic amidines. I. Electronic structure of some α -adrenergic benzylimidazolines, *J. Med. Chem.* **22**, 1290 (1979).
- [5097] McAlduff, E. J. Photoelectron spectra of substituted acetophenones. Correlations with reactivity, *Can. J. Chem.* **58**, 622 (1980).
- [5098] Greening, F. R., and King, G. W. Rydberg states of carbon diselenide, *J. Mol. Spectrosc.* **61**, 459 (1976).
- [5099] Houk, K. N., Bimanand, A., Mukherjee, D., Sims, J., Chang, Y.-M., Kaufman, D. C., and Domelsmith, L. N. Nitron ionization potentials and cycloaddition regioselectivities, *Heterocycles* **7**, 293 (1977).
- [5100] Cautelli, C., Furlani, C., and Storto, G. Coordinative bond and *d*-shell ionisations in the UV photoelectron spectra of bis(β -diketonato) cobalt (II) and copper (II) complexes, and their thioanalogues, *J. Electron Spectrosc. Relat. Phenom.* **18**, 329 (1980).
- [5101] Gürtler, P., Saile, V., and Koch, E. E. Rydberg series in the absorption spectra of H_2O and D_2O in the vacuum ultraviolet, *Chem. Phys. Letters* **51**, 386 (1977).
- [5102] Bock, H., Kaim, W., Kira, M., Osawa, H., and Sakurai, H. Radical ions XXVIII. Tris(trimethylsilylmethyl) aminium, $^+N(CH_2Si(CH_3)_3)_3$: A stable fluxional aminium radical cation, *J. Organometal. Chem.* **164**, 295 (1979).
- [5103] Fragalà, I., Ciliberto, E., Finocchiaro, P., and Recca, A. He(I) and He(II) excited photoelectron spectra and electronic structure of 'pseudoctahedral' dichloro- and dimethylbis(pentane- 2,4-dionato) tin(IV), *J. Chem. Soc. Dalton II*, 240 (1979).
- [5104] Kajitani, M., Sugimori, A., Sato, N., Seki, K., Inokuchi, H., and Harada, Y. Ultraviolet photoelectron spectra of crown ethers, *Bull. Chem. Soc. Japan* **52**, 2199 (1979).
- [5105] Thomas, R. K., and Thompson, H. The photoelectron spectra of allene, deuterioallenes and tetrafluoroallene, *Proc. R. Soc. London Ser. A*, **339**, 29 (1974).
- [5106] Stockbauer, R., and Rosenstock, H. M. Kinetic shift in methane and allene ion fragmentation, *Intern. J. Mass Spectrom. Ion Phys.* **27**, 185 (1978).
- [5107] Solouki, B., Rosmus, P., Bock, H., and Maier, G. Short-path pyrolysis: Silabenzene, *Angew. Chem. Int. Ed.* **19**, 51 (1980).
- [5108] Gleiter, R., Böhm, M. C., Haaland, A., Johansen, R., and Luszyk, J. Beryllocene, $(C_2H_5)_2Be$. The He (I) photoelectron spectrum and ab initio molecular orbital calculations, *J. Organometal. Chem.* **170**, 285 (1979).
- [5119] Martin, H.-D., and Pfföhler, P. Pentacyclo[6.4.0.0^{2,3}.0^{3,10}.0^{1,10}]dodeca-6,11-diene, an *o,o'*-*op'*-dimer of benzene, *Angew. Chem. Int. Ed.* **17**, 847 (1978).
- [5120] Traeger, J. C., and McLoughlin, R. G. Threshold photoionization and dissociation of toluene and cycloheptatriene, *J. Am. Chem. Soc.* **99**, 7351 (1977).
- [5121] Tajima, S., Azami, T., and Tsuchiya, T. An investigation of the decomposition of the common intermediate ions produced by electron impact, *Org. Mass. Spectrom.* **12**, 24 (1977).

- [5122] Schmidt, H., Schweig, A., and Vermeer, H. On the conformation of unsaturated arsines, *J. Mol. Struct.* **37**, 93 (1977).
- [5123] Schander, J., and Russell, B. R. Vacuum ultraviolet spectra of bromoethylene and dibromoethylenes, *J. Am. Chem. Soc.* **98**, 6900 (1976).
- [5124] Hudson, B. S., Ridyard, J. N. A., and Diamond, J. Polyene spectroscopy. Photoelectron spectra of the diphenylpolyenes, *J. Am. Chem. Soc.* **98**, 1126 (1976).
- [5125] Sell, J. A., and Kupperman, A. Angular distributions in the photoelectron spectra of benzene and its monohalogenated derivatives, *Chem. Phys.* **33**, 367 (1978).
- [5126] Smyth, K. C., Schiavone, J. A., and Freund, R. S. Dissociative excitation of CO by electron impact: Translational spectroscopy of long-lived high- Rydberg fragment atoms, *J. Chem. Phys.* **60**, 1358 (1974).
- [5127] Samson, J. A. R., Kemeny, P. C., and Haddad, G. N. Double ionization of CO₂ by photon impact, *Chem. Phys. Letters* **51**, 75 (1977).
- [5128] Suzuki, I. H., and Maeda, K. Behavior of hydrogen atoms in the fragmentation of CH₃CD₃, *Can. J. Chem.* **55**, 3124 (1977).
- [5129] Suzuki, I. H., and Maeda, K. Ionization efficiency curves of acetylene by mono-energetic electron impact, *Adv. Mass Spectrom.* **7**, 182 (1978).
- [5130] Stockbauer, R., and Inghram, M. G. Threshold photoelectron-photoion coincidence mass spectrometric study of ethylene and ethylene-d₄, *J. Chem. Phys.* **62**, 4862 (1975).
- [5131] Schulz, R., and Schweig, A. Existence of 1,2,3-benzoxadiazole in the gas phase, *Angew. Chem. Int. Ed.* **18**, 692 (1979).
- [5132] Frey, R., Gotchev, B., Kalman, O. F., Peatman, W. B., Pollak, H., and Schlag, E. W. Photoionization resonance spectra of CO₂⁺ and threshold electron-ion coincidence measurements of the fragmentation of CO₂⁺, *Chem. Phys.* **21**, 89 (1977).
- [5133] Nelsen, S. F., Hollinsed, W. C., Grezzo, L. A., and Parmelee, W. P. Conformational effects in 2,3- cycloalkyl-2,3-diazabicyclic tetraalkylhydrazines, *J. Am. Chem. Soc.* **101**, 7347 (1979).
- [5134] Fraga, I., Millefiori, S., and Recca, A. Gas phase ultraviolet photoelectron spectra of aromatic azomethine compounds, *J. Chem. Res.* **1**, 28 (1980).
- [5135] Golovin, A. V., Akopyan, M. E., Vilesov, F. I., and Sergeev, Y. L. Ion-electron coincidence study of the photoionization of formic and acetic acids, *Khim. Vys. Energ.* **13**, 200 (1979).
- [5136] Ghosh, S. N., and Verma, R. D. Rydberg states of the PO molecule, *J. Mol. Spectrosc.* **72**, 200 (1978).
- [5137] Frost, D. C., Lee, S. T., McDowell, C. A., and Westwood, N. P. C. The photoelectron spectrum of diazene (diimine), *Chem. Phys. Letters* **30**, 26 (1975).
- [5138] Maier, J. P., and Marthaler, O. Emission spectra of the radical cations of 1,3-dichlorobenzene, 1,4-dichlorobenzene and 1,3,5-trichlorobenzene in the gas phase, *Chem. Phys.* **32**, 419 (1978).
- [5139] Daamen, H., Oskam, A., and Stufkens, D. J. U.V.-photoelectron (He I and He II) studies of M(CO)₅PR₃ (M = Cr, W and R = C₆H₁₁, C₆H₅, O-i-C₃H₇, OC₆H₅) and W(CO)₅As(C₆H₅)₃, *Inorg. Chim. Acta* **38**, 71 (1980).
- [5140] Takezawa, S., and Tanaka, Y. The absorption spectrum of D₂ in the vacuum-uv region, Rydberg bands, $np\sigma^1\Sigma_u^+ \leftarrow X^1\Sigma_g^+$ and $np\pi^1\Pi_u \leftarrow X^1\Sigma_g^+$ with n=4-6, and the ionization energy, *J. Mol. Spectrosc.* **54**, 379 (1975).
- [5141] Cooks, R. G., Ast, T., and Beynon, J. H. A new method for the determination of double and triple ionization potentials of organic ions, *Intern. J. Mass. Spectrom. Ion Phys.* **11**, 490 (1973).
- [5142] Jonathan, N., Morris, A., Okuda, M., Ross, K. J., and Smith, D. J. Vacuum ultraviolet photoelectron spectroscopy of transient species, *J. Chem. Soc. Faraday Trans. II*, **70**, 1810 (1974).
- [5143] Mathur, B. P., Rothe, E. W., Reck, G. P., and Lightman, A. J. Two-photon ionization of Li₂: isotopic separation and determination of IP(Li₂) and D₀(Li₂⁺), *Chem. Phys. Letters* **56**, 336 (1978).
- [5144] Miescher, E. High resolution absorption spectrum of nitric oxide (NO) in the region of the first ionization limit, *Can. J. Phys.* **54**, 2074 (1976).
- [5145] Boschi, R. A., and Salahub, D. R. The far ultraviolet spectra of some branched chain iodo-alkanes, iodo-cyclo-alkanes, fluoro-iodo-alkanes and iodoalkenes, *Mol. Phys.* **24**, 735 (1972).
- [5146] McCulloh, K. E. Energetics and mechanisms of fragment ion formation in the photoionization of normal and deuterated water and ammonia, *Int. J. Mass Spectrom. Ion Phys.* **21**, 333 (1976).
- [5147] Appell, J., Durup, J., Fehsenfeld, F. C., and Fournier, P. Doubly ionized states of some polyatomic molecules studied by double charge transfer spectroscopy, *J. Phys.* **B**, **7**, 406 (1974).
- [5148] Burroughs, P., Evans, S., Hamnett, A., Orchard, A. F., and Richardson, N. V. He-I photoelectron spectra of some d⁰ transition metal compounds, *J. Chem. Soc. Faraday Trans. II* **70**, 1895 (1974).
- [5149] Avni, R., and Klein, F. S. The first ionization potential of uranium and thorium measured in a d.c. arc plasma, *Spectrochim. Acta* **25B**, 331 (1973).
- [5150] Gupta, S. K., Pelino, M., and Gingerich, K. A. Dissociation energy of the gaseous molecule PtTi by high-temperature Knudsen effusion mass spectrometry, *J. Phys. Chem.* **83**, 2335 (1979).
- [5151] Cvitaš, T., and Klasinc, L. High resolution photoelectron spectrum of hydrazoic acid, *J. Chem. Soc. Faraday Trans. II*, **72**, 1240 (1976).
- [5153] Busse, B., and Weil, K. G. Existence and bond energy of the cesium auride molecule, *Angew. Chem. Int. Ed.* **18**, 629 (1979).
- [5154] Harland, P. W., Cradock, S., and Thynne, J. C. J. Positive- and negative-ion formation due to the electron bombardment of germanium tetrafluoride, *Int. J. Mass Spectrom. Ion Phys.* **10**, 169 (1972/73).
- [5159] Gacek, M., Thorstad, O., Ongstad, L., and Undheim, K. Ionisation potentials in tautomer analysis of 2-hydroxypyrimidines, *Chem. Scripta* **13**, 99 (1978).
- [5161] Watanabe, I., Yokoyama, Y., and Ikeda, S. Vibrational structures in the He(I) photoelectron spectra of carboxylic acids, *Bull. Chem. Soc. Japan* **47**, 627 (1974).
- [5162] Yoshino, K., and Tanaka, Y. Absorption spectrum of krypton in the vacuum UV region, *J. Opt. Soc. Am.* **69**, 159 (1979).
- [5163] Zmbov, K. F., and Miletic, M. Mass spectrometric determination of the dissociation energy of PbO₂ and ionization potentials of PbO and PbO₂ molecules, *Advan. Mass Spectrom.* **7A**, 573 (1978).
- [5164] Wu, C. H. Thermochemical properties of gaseous Li₂ and Li₃, *J. Chem. Phys.* **65**, 3181 (1976).
- [5165] Worden, E. F., and Conway, J. G. Laser spectroscopy of neptunium; first ionization potential, lifetimes and new high-lying energy levels of Np I, *J. Opt. Soc. Am.* **69**, 733 (1979).
- [5166] Farber, M., and Srivastava, R. D. Mass spectrometric determination of the heats of formation of the silicon bromides SiBr(g), SiBr₂(g), and SiBr₃(g), *High Temp. Sci.* **12**, 21 (1980).
- [5167] Fock, J.-H., Gürtler, P., and Koch, E. E. Molecular Rydberg transitions in carbon monoxide: term value/ionization energy correlation of BF, CO and N₂, *Chem. Phys.* **47**, 87 (1980).

- [5168] Fraga, I., Ciliberto, E., Egdell, R. G., and Granozzi, G. He(I) and He(II) photoelectron spectra of methyltin chlorides, *J. Chem. Soc. Dalton*, 145 (1980).
- [5169] Gupta, S. K., and Gingerich, K. A. Observation and atomization energies of the gaseous uranium carbides, UC, UC₂, UC₃, UC₄, UC₅, and UC₆, by high temperature mass spectrometry, *J. Chem. Phys.* **71**, 3072 (1979).
- [5170] Hitchcock, A. P., Brion, C. E., and Van der Wiel, M. J. Absolute oscillator strengths for valence-shell ionic photofragmentation of N₂O and CO₂ (8–75 eV), *Chem. Phys.* **45**, 461 (1980).
- [5171] Ho, P., and Burns, R. P. A mass spectrometric study of the AlO₂ molecule, *High Temp. Sci.* **12**, 31 (1980).
- [5172] Lee, E. P. F., Potts, A. W., Doran, M., Hillier, I. H., Delaney, J. J., Hawksworth, R. W., and Guest, M. F. Photoelectron spectra and electronic structure of the transition metal dichlorides, MCl₂ (M = Cr, Mn, Fe, Co, Ni), *J. Chem. Soc. Faraday II*, **76**, 506 (1980).
- [5173] Momigny, J., Wankenne, H., and Krier, C. Correlation diagram approach to the dissociative ionization mechanisms of methanol, *Intern. J. Mass Spectrom. Ion Phys.* **35**, 151 (1980).
- [5174] Nishimura, T., Niwa, Y., Tsuchiya, T., and Nozoye, H. Ionic dissociation of methanol studied by photoelectron-photoion coincidence spectroscopy, *J. Chem. Phys.* **72**, 2222 (1980).
- [5175] Powis, I. The dissociation of state-selected CF₃X⁺ molecular ions, *Mol. Phys.* **39**, 311 (1980).
- [5176] Stephan, K., Helm, H., Kim, Y. B., Seykora, G., Ramler, J., Grössl, M., Märk, E., and Märk, T. D. Single and double ionization of nitrogen dioxide by electron impact from threshold up to 180 eV, *J. Chem. Phys.* **73**, 303 (1980).
- [5177] Pittermann, U., and Weil, K. G. Massenspektrometrische Untersuchungen an Silberhalogeniden V: Verdampfung von Silberiodid, *Ber. Bunsenges. Phys. Chem.* **84**, 542 (1980).
- [5178] Imre, D., and Koenig, T. The He(I) photoelectron spectrum of atomic iodine by photodissociation of molecular iodine, *Chem. Phys. Letters* **73**, 62 (1980).
- [5179] Reader, J. Energy levels of singly ionized cesium (Cs II), *Phys. Rev. A* **13**, 507 (1976).
- [5180] Reader, J. Spectrum and energy levels of singly ionized rubidium (Rb II), *J. Opt. Soc. Am.* **65**, 286 (1975).
- [5181] Rosenstock, H. M., Stockbauer, R., and Parr, A. C. Kinetic shift in chlorobenzene ion fragmentation and the heat of formation of the phenyl ion, *J. Chem. Phys.* **71**, 3708 (1979).
- [5182] Nielsen, U., and Schwarz, W. H. E. VUV spectra of the xenon fluorides, *Chem. Phys.* **13**, 195 (1976).
- [5183] Causley, G. C., and Russell, B. R. Vacuum ultraviolet absorption spectra of dichlorosilane, dichloromethylsilane and dichlorodimethylsilane, *J. Electron Spectrosc. Relat. Phenom.* **8**, 71 (1976).
- [5184] Maier, J. P., Marthaler, O., and Mohraz, M. Emission spectra of the cations of some fluorosubstituted phenols in the gaseous phase, *J. Electron Spectrosc. Relat. Phenom.* **19**, 11 (1980).
- [5185] Brown, R. S., Influence of remote substituents on ionization potential. Part II. Enamines, *Can. J. Chem.* **54**, 1521 (1976).
- [5186] Worden, E. F., Solarz, R. W., Paisner, J. A., and Conway, J. G. First ionization potentials of lanthanides by laser spectroscopy, *J. Opt. Soc. Am.* **68**, 52 (1978).
- [5187] Leutwyler, S., Herrmann, A., Wöste, L., and Schumacher, E. Isotope selective two-step photoionization study of K₂ in a supersonic molecular beam, *Chem. Phys.* **48**, 253 (1980).
- [5188] Ihle, H. R., Wu, C. H., Miletic, M., and Zmbov, K. F. Mass spectrometric studies of gas species in the systems Si–Cl and Si–Li, *Adv. Mass Spectrom.* **7A**, 670 (1978).
- [5189] Ajò, D., Granozzi, G., Tondello, E., and Fraga, I. Nature of the metal–metal bond in *triangolo*-Ru₃(CO)₁₂ from UV photoelectron spectroscopy and quantum mechanical calculations, *Inorg. Chim. Acta* **37**, 191 (1979).
- [5190] Betteridge, D., Thompson, M., Baker, A. D., and Kemp, N. R. Photoelectron spectra of phosphorus halides, alkyl phosphites and phosphates, organophosphorus pesticides, and related compounds, *Anal. Chem.* **44**, 2005 (1972).
- [5191] Bursten, B. E., Cotton, F. A., Cowley, A. H., Hanson, B. E., Lattman, M., and Stanley, G. S. Strong metal-to-metal quadruple bonds in a series of five isostructural compounds as indicated by photoelectron spectroscopy, *J. Am. Chem. Soc.* **101**, 6244 (1979).
- [5192] Spanget-Larsen, J., Gleiter, R., De Meijere, A., and Binger, P. Linear combination of Walsh orbitals in tris-σ-homobenzenes, *Tetrahedron* **35**, 1385 (1979).
- [5193] Carnovale, F., Gan, T. H., Peel, J. B., and Franz, K.-D. Photoelectron spectroscopic studies of some alkoxy phenalenones, *Tetrahedron* **35**, 129 (1979).
- [5194] Böhm, M. C., and Gleiter, R. Electronic structure and reactivity of propellanes, *Tetrahedron* **35**, 675 (1979).
- [5195] Moseley, J. T., Saxon, R. P., Huber, B. A., Cosby, P. C., Abouaf, R., and Tadjeddine, M. Photofragment spectroscopy and potential curves of Ar₂⁺, *J. Chem. Phys.* **67**, 1659 (1977).
- [5196] Jochims, H. W., Lohr, W., and Baumgärtel, H. Photoreactions of small organic molecules V. Absorption-, photoion- and resonancephotoelectronspectra of CF₃Cl, CF₂Cl₂, CFCl₃ in the energy range 10–25 eV, *Ber. Bunsenges.* **80**, 130 (1976).
- [5197] Mattsson, L., Karlsson, L., Jadrny, R., and Siegbahn, K. Valence electron spectrum of C₆H₆ excited by linearly polarized HeI radiation, *Phys. Scripta* **16**, 221 (1977).
- [5198] Manne, R., Wittel, K., and Mohanty, B. S. Spinorbit interaction in molecular photoelectron spectra An intermediate coupling approach, *Mol. Phys.* **29**, 485 (1975).
- [5199] McDiarmid, R. On the ultraviolet spectrum of *trans*-1,3-butadiene, *J. Chem. Phys.* **64**, 514 (1976).
- [5200] Harris, D., McKinnon, S., and Boyd, R. K. The origins of the base peak in the electron impact spectrum of limonene, *Org. Mass Spectrom.* **14**, 265 (1979).
- [5201] Willett, G. D., and Baer, T. Thermochemistry and dissociation dynamics of state-selected C₄H₅X ions. 3. C₄H₅N⁺, *J. Am. Chem. Soc.* **102**, 6774 (1980).
- [5202] Rücker, C., Lang, D., Sauer, J., Friege, H., and Sustmann, R. Reaktivität substituierter 1,3-Butadiene in Diels-Alder-Reaktionen, *Chem. Ber.* **113**, 1663 (1980).
- [5203] Ciliberto, E., Costanzo, L. L., Fraga, I., and Granozzi, G. Ultraviolet photoelectron spectra of 'octahedral' (diethyldithiophosphato) metal(III) complexes, *Inorg. Chim. Acta* **44**, L25 (1980).
- [5204] Bock, H., and Brähler, U. G. Oxidation und Reduktion methylthio-substituierter Naphthaline – ein Vergleich von Molekülzuständen, *Chem. Ber.* **112**, 3081 (1979).
- [5205] Locht, R., Olivier, J. L., and Momigny, J. Dissociative autoionization as a mechanism for the proton formation from methane and methane-d₄ by low energy electron impact, *Chem. Phys.* **43**, 425 (1979).
- [5206] Fraga, I., Ciliberto, E., Granozzi, G., and Deganello, G. He-I and He-II excited photoelectron spectra of cycloheptatrienetricarbonyl complexes of group VIA metals, *J. Organometal. Chem.* **182**, 511 (1979).
- [5207] Solouki, B., Bock, H., and Appel, R. Sequence of orbitals in sulfones and sulfodiimides, *Angew. Chem. Int. Ed.* **11**, 927 (1972).
- [5208] Jonathan, N., Morris, A., Okuda, M., Smith, D. J., and Ross, K. J. Photoelectron spectroscopy of transient species: The CS molecule, *Chem. Phys. Letters* **13**, 334 (1972).
- [5209] Čermák, V. Electron spectroscopy of autoionizing states of

- oxygen, chlorine and bromine atoms, *J. Electron Spectrosc. Relat. Phenom.* **6**, 135 (1975).
- [5210] Davis, R., Ojo, I. A., and Webb, M. L. Mass spectrometry of transition-metal π -complexes, V.-Fragmentation and structure of chromium-coordinated $[C_2H_6]^+$ and $[C_6H_{10}]^+$ ions, *Org. Mass Spectrom.* **13**, 547 (1978).
- [5211] Hall, D., Maier, J. P., and Rosmus, P. Electronic states of ketene radical cation, *Chem. Phys.* **24**, 373 (1977).
- [5212] Coughlin, D. J., Brown, R. S., and Salomon, R. G. The prostaglandin endoperoxide nucleus and related bicyclic peroxides. Synthetic and spectroscopic studies, *J. Am. Chem. Soc.* **101**, 1533 (1979).
- [5213] Daamen, H., Oskam, A., Stufkens, D. J., and Waaijers, H. W. Bonding properties of group VIB metal pentacarbonyl azole complexes studied by electronic absorption, photoelectron, ^{13}C NMR and vibrational spectroscopy, *Inorg. Chim. Acta* **34**, 253 (1979).
- [5214] Kimura, K., Yamazaki, T., and Achiba, Y. He I (584 Å) photoelectron spectra and photoionization cross sections of atomic chlorine and bromine, *Chem. Phys. Letters* **58**, 104 (1978).
- [5215] Katritzky, A. R., Baker, V. J., Brito-Palma, F. M. S., Patel, R. C., Pfister-Guillouzo, G., and Guimon, C. Conformational analysis of saturated heterocycles. Part 94. Applications of photoelectron spectroscopy to molecular properties. Part 3. Photoelectron spectroscopic studies of some 1-oxa-3,4-diaza-, 1-thia-3,4-diaza-, 1,2,4-triaza-, and 1,2,4,5-tetraaza-cyclohexanes, *J. Chem. Soc. Perkin II* 91, (1980).
- [5216] Bock, H., Bowling, R. A., Solouki, B., Barton, T. J., and Burns, G. T. Analysis and optimization of gas phase reactions. 13.^{1,2}Silatoluene, *J. Am. Chem. Soc.* **102**, 429 (1980).
- [5217] Fragalà, I., Ciliberto, E., and Thomas, J. L. He(I) and He(II) excited photoelectron spectra of cyclopentadienyldicarbonyltitanium(II), *J. Organometal. Chem.* **175**, C25 (1979).
- [5218] Chau, F. T., and McDowell, C. A. The HeI photoelectron spectrum of *trans*-1,2-dibromocyclohexane, *J. Mol. Struct.* **34**, 93 (1976).
- [5220] Syrvatka, B. G., and Gil'burd, M. M. Mass-spectrometric study of trifluoronitrosomethane, *Russ. J. Phys. Chem.* **47**, 1215 (1973).
- [5222] Dunlavey, S. J., Dyke, J. M., and Morris, A. The first ionization potential of the $BrO(X^2H)$ radical obtained using photoelectron spectroscopy, *Chem. Phys. Letters* **53**, 382 (1978).
- [5223] Colin, R., and De Greef, D. The absorption spectrum of the BeH and BeD molecules in the vacuum ultraviolet, *Can. J. Phys.* **53**, 2142 (1975).
- [5224] Guimon, C., Pfister-Guillouzo, G., and Arbelot, M. Spectres photoélectroniques de la dithiole-1,3- thione-2 et de son dérivé benzosubstitué, *J. Mol. Struct.* **30**, 339 (1976).
- [5225] Hillier, I. H., Guest, M. F., Higginson, B. R., and Lloyd, D. R. *Ab initio* calculations of transition metal complexes V. The electronic structure and He(I) photoelectron spectra of $Fe(CO)_2(NO)_2$, $Co(CO)_3NO$ and $Ni(CO)_4$, *Mol. Phys.* **27**, 215 (1974).
- [5227] Kováčik, V., Mihálov, V., and Kováč, P. Identification of methyl (methyl *O*-acetyl-*O*-methyl-hexopyranosid)uronates by mass spectrometry, *Carbohydr. Res.* **54**, 23 (1977).
- [5228] Guimon, C., Pfister-Guillouzo, G., Bernardini, A., and Viallefont, P. A photoelectron study (HeI, HeII) of the tautomeric equilibrium of chloro- and bromo-1,2,4-triazoles, *Tetrahedron* **36**, 1071 (1980).
- [5229] Piacente, V., Bardi, G., di Paolo, V., and Ferro, D. The vapour pressure over Ga_2S_3 and Ga_2Se_3 , *J. Chem. Thermodyn.* **8**, 391 (1976).
- [5230] Kuck, D., and Grützmacher, H.-Fr. The activation energy of the skeletal isomerization in the radical cations of toluene and cycloheptatriene by mass spectrometry of their 2-phenylethyl derivatives, *Org. Mass Spectrom.* **14**, 86 (1979).
- [5231] Shaw, R. W., Jr., and Thomas, T. D. Auger electron spectrum and ionization potentials of the HF molecule, *Phys. Rev. A* **11**, 1491 (1975).
- [5232] Sell, J. A., and Kupperman, A. Angular distributions in the photoelectron spectroscopy of SF_6 , *Chem. Phys.* **33**, 379 (1978).
- [5233] Johansson, S. The spectrum and term system of Fe II, *Physica Scripta* **18**, 217 (1978).
- [5235] Paguette, L. A., Ku, A. Y., Santiago, C., Rozenboom, M. D., and Houk, K. N. Control of regioselectivity in the di- π -methane rearrangement. Triplet-sensitized photoisomerization of benzonorbornadienes carrying cyano substituents in the aryl and vinyl segments, *J. Am. Chem. Soc.* **101**, 5972 (1979).
- [5238] Lassiter, T. W., Allen, J. D., Jr., and Schweitzer, G. K. The photoelectron spectroscopic characterization of vapors above heated alkali tetrafluoroaluminates, alkali tetrachloroaluminates, and ammonium tetrachloroaluminate, *J. Electron Spectrosc. Relat. Phenom.* **19**, 321 (1980).
- [5239] Biefeld, R. M. The vaporization thermodynamics of rubidium iodide as determined by mass-loss Knudsen effusion and mass spectrometry, *J. Chem. Thermodyn.* **10**, 907 (1978).
- [5240] Mark, T. D., and Hille, E. Cross section for single and double ionization of carbon dioxide by electron impact threshold up to 180 eV, *J. Chem. Phys.* **69**, 2492 (1978).
- [5241] Stadelmann, J. P., and Vogt, J. A photoelectronphotoion coincidence study of *cis*- and *trans*- difluoroethene, *Intern. J. Mass Spectrom. Ion Phys.* **35**, 83 (1980).
- [5242] Miletić, M., Ereš, D., Veljković, M., and Zmbov, K. F. Mass spectrometric study of the ionization and fragmentation of carbon disulphide by mono- energetic electron impact, *Intern. J. Mass Spectrom. Ion Phys.* **35**, 231 (1980).
- [5243] Ajò, D., Ciliberto, E., Fragalà, I., and Granozzi, G. Lone-pair interactions in the photoelectron spectra of dicarboxylic acids: Malonic acid and its α -alkyl derivatives, *J. Mol. Struct.* **62**, 189 (1980).
- [5244] Selim, E. T. M. Ionization and dissociation of propylene by electron impact, *Indian J. Pure Appl. Phys.* **18**, 31 (1980).
- [5245] Hochmann, P., Templet, P. H., Wang, H.-t., and McGlynn, S. P. Molecular Rydberg transitions. I. Low- energy Rydberg transitions in methyl halides, *J. Chem. Phys.* **62**, 2588 (1975).
- [5246] Domelsmith, L. N., Houk, K. N., Piedrahita, C., and Dolbier, W. J., Jr. The photoelectron spectrum of 1,1-difluoroallene. On π electron donation and withdrawal by fluorine, *J. Am. Chem. Soc.* **100**, 6908 (1978).
- [5247] Palenius, H. P., Huffman, R. E., Larrabee, J. C., and Tanaka, Y. The absorption spectrum of fluorine F I observed with the helium continuum, *J. Opt. Soc. Am.* **68**, 1564 (1978).
- [5248] Wiberg, N., Fischer, G., and Bachhuber, H. Diazen und andere Distickstoffhydride: Bildungswärmen, Dissoziationsenergien, Aufttrittspotentiale, Protonenaffinitäten, *Z. Naturforsch.* **34b**, 1385 (1979).
- [5249] Utsunomiya, C., Kobayashi, T., and Nagakura, S. Photoelectron angular distribution measurements for some aliphatic alcohols, amines, and halides, *Bull. Chem. Soc. Japan* **53**, 1216 (1980).
- [5250] Fragalà, I., Ciliberto, E., Granozzi, G., and Deganello, G. He-I and He-II excited photoelectron spectra of cycloheptatrienetricarbonyl complexes of group VIA metals, *J. Organometal. Chem.* **182**, 511 (1979).
- [5251] Carnovale, F., Gan, T. H., and Peel, J. B. Photoelectron spectroscopic studies of the monomers and dimers of

- acetic and trifluoroacetic acids, *J. Electron Spectrosc. Relat. Phenom.* **20**, 53 (1980).
- [5252] Tudeli, B. C., and Price, S. J. W. The ultraviolet photoelectron spectra of C_6F_5X compounds, $X=(F, Cl, Br, I, H, CH_3)$, *Can. J. Chem.* **57**, 2256 (1979).
- [5253] Colbourne, D., Frost, D. C., McDowell, C. A., and Westwood, N. P. C. The vacuum ultraviolet photoelectron spectrum of difluoramine, *Chem. Phys. Letters* **72**, 247 (1980).
- [5254] Wu, C. H. Binding energies of LiH_2 and LiH_2^+ and the ionization potential of LiH_2 , *J. Chem. Phys.* **71**, 783 (1979).
- [5255] Dickson, R. S., Carnovale, F., and Peel, J. B. A photoelectron spectroscopic study of $[Rh(CO)_2Cl]_2$, *J. Organometal. Chem.* **179**, 115 (1979).
- [5256] Potts, A. W., and Fattahallah, G. H. High-resolution ultraviolet photoelectron spectroscopy of CO_2 , COS and CS_2 , *J. Phys. B: Atom. Molec. Phys.* **13**, 2545 (1980).
- [5257] Potts, A. W., Lyus, M. L., Lee, E. P. F., and Fattahallah, G. H. High resolution ultraviolet photoelectron spectra of C_6H_5X and $p-C_6H_4X_2$ where $X = Cl, Br$ or I , *J. Chem. Soc. Faraday II*, **76**, 556 (1980).
- [5258] Klasinc, L., Novak, I., Scholz, M., and Kluge, G. Photoelektronenspektren substituierter Pyridine und Benzole und ihre Interpretation durch die CNDO/SWW-Methode, *Croat. Chem. Acta* **51**, 43 (1978).
- [5259] Palmer, M. H., Moyes, W., and Spiers, M. The electronic structure of substituted benzenes: Ab initio calculations and photoelectron spectra for benzonitrile, the tolunitriles, fluorobenzonitriles, dicyanobenzenes and ethynylbenzene, *J. Mol. Struct.* **62**, 165 (1980).
- [5260] Arnold, D. R., and Wong, P. C. The oxidation potentials of *cis*- and *trans*-1,2-diphenylcyclopropane and *cis*- and *trans*-2,3-diphenyloxirane, *Can. J. Chem.* **57**, 2098 (1979).
- [5261] Drake, J. E., Giavinćevski, B. M., and Gorzelska, K. The photoelectron spectra of dimethylgermane, difluoro- and dichlorodimethyl germane, *Can. J. Chem.* **57**, 2278 (1979).
- [5262] Nomoto, K., Achiba, Y., and Kimura, K. HeI and HeII photoelectron study of N_2O_4 , *Bull. Chem. Soc. Japan* **52**, 1614 (1979).
- [5263] Holmes, J. L., and Lossing, F. P. Thermochemistry and unimolecular reactions of ionized acetic acid and its enol in the gas phase, *J. Am. Chem. Soc.* **102**, 3732 (1980).
- [5264] Morgan, R. P., Derrick, P. J., and Loudon, A. G. Kinetics and mechanisms of the decompositions of the molecular ions of pentanal and its monomethyl- substituted homologues in the picosecond to microsecond time interval following field ionization, *J. Chem. Soc. Perkin II*, 306 (1980).
- [5265] Scharf, H.-D., Plum, H., Fleischhauer, J., and Schleker, W. Zur Diels-Alder-Reaktivität *s-cis*- fixierter 1,3-Diene, *Chem. Ber.* **112**, 862 (1979).
- [5266] Appell, J., and Horsley, J. A. Electronic states of doubly ionized ammonia, *J. Chem. Phys.* **60**, 3445 (1974).
- [5267] Holmes, J. L., Yuan, D., and Rye, R. T. B. Metastable ion studies, VII-Loss of water from the molecular ion of cyclopentanol, *Org. Mass Spectrom.* **12**, 254 (1977).
- [5268] Holmes, J. L., Weese, G. M., Blair, A. S., and Terlouw, J. K. Metastable ion studies IX-Thermochemistry and ion structures among fragmenting $[C_4H_8]^+$ ions, an electron impact and field ionization investigation, *Org. Mass Spectrom.* **12**, 424 (1977).
- [5269] Domcke, W., Cederbaum, L. S., Schirmer, J., Von Niessen, W., and Maier, J. P. Breakdown of the molecular orbital picture of ionization for inner valence electrons: experimental and theoretical study of H_2S and PH_3 , *J. Electron Spectrosc. Relat. Phenom.* **14**, 59 (1978).
- [5270] Jochims, H. W., Lohr, W., and Baumgärtel, H. Photoionization mass spectrometry studies of deuterated acetaldehydes CH_3CDO and CD_3CHO , *Chem. Phys. Letters* **54**, 594 (1978).
- [5271] Schäfer, W., Schweig, A., Dimroth, K., and Kanter, H. Nature of bonding in λ^5 -phosphorins, *J. Am. Chem. Soc.* **98**, 4410 (1976).
- [5272] Kobayashi, T., and Nagakura, S. Photoelectron spectra of substituted benzenes, *Bull. Chem. Soc. Japan* **47**, 2563 (1974).
- [5273] Ogata, H., Kitayama, J., Koto, M., Kojima, S., Nihei, Y., and Kamada, H. Vacuum ultraviolet absorption and photoelectron spectra of aliphatic ketones, *Bull. Chem. Soc. Japan* **47**, 958 (1974).
- [5274] Williamson, A. D., Compton, R. N., and Eland, J. H. D. Accurate photoionization thresholds by multiphoton ionization: Pyrrole, *J. Chem. Phys.* **70**, 590 (1979).
- [5275] Rauh, E. G., and Ackermann, R. J. Erratum: First ionization potentials of some refractory oxide vapors, *J. Chem. Phys.* **64**, 1862 (1976).
- [5276] Potzinger, P., Ritter, A., and Krause, J. Massenspektrometrische Bestimmung von Bindungsenergien in siliciumorganischen Verbindungen, *Z. Naturforsch.* **30a**, 347 (1975).
- [5277] Nakato, Y., Ozaki, M., and Tsubomura, H. Ionization energies and Rydberg states of tetraaminoethylenes, *Bull. Chem. Soc. Japan* **45**, 1299 (1972).
- [5278] Nakato, Y., Chiyoda, T., and Tsubomura, H. Experimental determination of ionization potentials of organic amines, β -carotene and chlorophyll a, *Bull. Chem. Soc. Japan* **47**, 3001 (1974).
- [5279] Orlov, V. M., Varshavsky, Y. M., and Miroshnikov, A. I. Photoionisation mass spectra of volatile derivatives of short peptides and appearance potentials of their characteristic ions, *Org. Mass Spectrom.* **9**, 811 (1974).
- [5280] Nelsen, S. F., Peacock, V., and Weisman, G. R. Single-electron oxidation equilibria of tetraalkylhydrazines. Comparison of solution E° values and vapor-phase ionization potentials, *J. Am. Chem. Soc.* **98**, 5269 (1976).
- [5281] Böhm, M. C., Gleiter, R., and Batich, C. D. 106. The photoelectron spectra of Ni, Pd, Pt-Diallyl), *Helv. Chim. Acta* **63**, 990 (1980).
- [5282] Holmes, J. L., and Lossing, F. P. The reactivity of $[C_4H_7^+]$ ions; a thermochemical study, *Can. J. Chem.* **57**, 249 (1979).
- [5283] Butler, J. J., and Baer, T. Thermochemistry and dissociation dynamics of state-selected C_4H_5X ions. 1. Thiophene, *J. Am. Chem. Soc.* **102**, 6764 (1980).
- [5284] Wolkoff, P., and Holmes, J. L. Fragmentations of alkane molecular ions, *J. Am. Chem. Soc.* **100**, 7346 (1978).
- [5285] Cauletti, C., Tarli, F., Monaci, A., Bonapasta, A. A., and Bossa, M. Ultraviolet photoelectron spectra of some methyl esters of dithiocarbamic acids and of $[Ni\{N(CH_3)_2-N=C(S)SCH_3\}_2]$ and comparison with quantum-mechanical calculations, *J. Chem. Soc. Dalton* 1087 (1980).
- [5286] Connor, J. A., Martinho-Simoes, J. A., Skinner, H. A., and Zafarani-Moattar, M. T. Thermochemistry of *bis*-Arene- and Arenetricarbonyl-chromium compounds containing hexamethylbenzene, 1,3,5-trimethylbenzene and naphthalene, *J. Organometal. Chem.* **179**, 331 (1979).
- [5287] Gusel'nikov, L. E., and Nametkin, N. S. 1,1-dimethyl-1-silaethylene. Heat of formation, ionization potential and the energy of the silicon-carbon π -bond, *J. Organometal. Chem.* **169**, 155 (1979).
- [5288] Rademacher, P., and Freckmann, B. Photoelektronenspektren und Konformations-verhalten von Hydroxylamin und Methylhydroxylaminen, *J. Electron Spectrosc. Relat. Phenom.* **19**, 251 (1980).
- [5289] Willett, G. D., and Baer, T. Thermochemistry and dissociation dynamics of state-selected C_4H_5X ions. 2. Furan and 3-butyn-2-one, *J. Am. Chem. Soc.* **102**, 6769 (1980).
- [5290] Tang, S.-Y., McGowan, J. C., Singh, M., Galatsis, P., Ellis, B.

- E., Boyd, R. K., and Brown, S. A. Mass spectrometry of some furanocoumarins, *Can. J. Chem.* **57**, 1995 (1979).
- [5291] Michels, G. D., Flesch, G. D., and Svec, H. J. Comparative mass spectrometry of the group 6B hexacarbonyls and pentacarbonyl thiocarbonyls, *Inorg. Chem.* **19**, 479 (1980).
- [5292] Distefano, G., Eoffani, A., Innorta, G., and Pignataro, S. Electron impact ionization potentials of some manganese, chromium and tungsten organometallic derivatives, *Int. J. Mass Spectrom. Ion Phys.* **7**, 383 (1971).
- [5293] McLoughlin, R. G., Morrison, J. D., and Traeger, J. C. Photoionization of the C-1 - C-4 monosubstituted alkyl benzenes: Thermochemistry of $[C_7H_7]^+$ and $[C_8H_9]^+$ formation, *Org. Mass Spectrom.* **14**, 104 (1979).
- [5294] Neubert, A. Mass spectrometric determination of the atomization energies of $Te_n(n=3-7)$ molecules, *High Temp. Sci.* **10**, 261 (1978).
- [5295] Noodleman, L., Westwood, N. P. C., and Mitchell, K. A. R. Ionization energies and electronic structure of $N_3P_3Cl_6$ as determined by UV photoelectron spectroscopy and the $X\alpha$ scattered wave method, *Chem. Phys. Letters* **58**, 252 (1978).
- [5296] Hilpert, K. Mass spectrometric determination of the dissociation energies of CuTb(g), CuDy(g), and CuHo(g), *Ber. Bunsenges. Phys. Chem.* **83**, 161 (1979).
- [5297] Berkowitz, J., Batson, C. H., and Goodman, G. L. Photoelectron spectroscopy of AgCl, AgBr, and AgI vapors, *J. Chem. Phys.* **72**, 5829 (1980).
- [5298] Ernsting, N. P., Pfab, J.; Green, J. C., and Römel, J. Photoelectron spectra of nitrosomethane, *n*-nitrosobutane and some perhalogenonitrosomethanes, *J. Chem. Soc. Faraday II* **76**, 844 (1980).
- [5299] Trott, W. M., Blais, N. C., and Walters, E. A. Photoionization of carbon disulfide monomers and dimers in a supersonic molecular beam, *J. Chem. Phys.* **71**, 1692 (1979).
- [5300] Creber, D. K., and Bancroft, G. M. Photoelectron studies of dialkyl group 2B compounds: Ligand field splittings and intensity variations with photon energy, *Inorg. Chem.* **19**, 643 (1980).
- [5301] Rademacher, P., and Freckmann, B. Photoelectron spectra and conformations of tetrahydro-1,2-oxazines and isoxazolidines, *Tetrahedron Letters* 841 (1978).
- [5303] Haque, R., Pelino, M., and Gingerich, K. A. Investigation of the thermodynamic stability of the molecule LaIr(g) by high temperature mass spectrometry, *J. Chem. Phys.* **71**, 2929 (1979).
- [5304] Carnovale, F., Gan, T.-H., and Peel, J. B. The photoelectron spectra of the *N*-chloro and *N*-bromo derivatives of dimethylamine, *Aust. J. Chem.* **32**, 719 (1979).
- [5305] Mohraz, M., Maier, J. P., and Heilbronner, E. He(I α) and He(II α) photoelectron spectra of fluorinated chloro- and bromo-benzenes, *J. Electron Spectrosc. Relat. Phenom.* **19**, 429 (1980).
- [5306] Gupta, S. K., and Gingerich, K. A. A thermodynamic study of the gaseous thorium carbides, ThC, ThC₂, ThC₃, ThC₄, ThC₅, and ThC₆, *J. Chem. Phys.* **72**, 2795 (1980).
- [5307] Tiedemann, P. W., Anderson, S. L., Ceyer, S. T., Hirooka, T., Ng, C. Y., Mahan, B. H., and Lee, Y. T. Proton affinities of hydrogen halides determined by the molecular beam photoionization method, *J. Chem. Phys.* **71**, 605 (1979).
- [5308] Gan, T.-H., and Peel, J. B. Photoelectron spectroscopic studies of piperidine and its *N*-halo derivatives, *Aust. J. Chem.* **32**, 475 (1979).
- [5309] Guimon, C., Pfister-Guillouzo, G., Begtrup, M. Photoelectron spectra of some pyrazolthiones, 1,2,3-triazolthiones, and 4-(1,2,3-triazolio) sulfides. Evidence of an abnormal effect of methylation, *J. Am. Chem. Soc.* **100**, 1275 (1978).
- [5310] Friege, H., and Klessinger, M. Elektronenstruktur von Alkyl-aryl- und Alkyl-vinyl-ethern, *Chem. Ber.* **112**, 1614 (1979).
- [5311] Potzinger, P., Stracke, H.-U., Küpper, W., and Gollnick, K. Ionisierungs- und Auftrittspotentialmessungen an Dialkylsulfoxiden, *Z. Naturforsch.* **30a**, 340 (1975).
- [5313] Bieri, G., Schmelzer, A., Asbrink, L., and Jonsson, M. Fluorine and the fluoroderivatives of acetylene and diacetylene studied by 30.4 nm He(II) photoelectron spectroscopy, *Chem. Phys.* **49**, 213 (1980).
- [5314] Martin, H.-D., Heller, C., Mayer, B., and Beckhaus, H.-D. Synthese bicyclischer, nicht-konjugierter Polyene. Stereochemie und transanulare Wechselwirkungen, *Chem. Ber.* **113**, 2589 (1980).
- [5315] Mohraz, M., Jian-qi, W., Heilbronner, E., Vogel, P., and Pilet, O. 57. Radical cation states of 2,3,5,6,7,8-hexamethylidenebicyclo[2.2.2]octane, *Helv. Chim. Acta* **63**, 568 (1980).
- [5316] Broer, W. J., and Weringa, W. D. Potential energy profiles for the unimolecular reactions of $[C_3H_5S]^+$ ions, *Org. Mass Spectrom.* **15**, 229 (1980).
- [5317] Granozzi, G., Tondello, E., Bénard, M., and Fragalà, I. Electronic structure of $trans-[(\eta^5-C_5H_5)Fe(CO)_2]_2$ by He(I) and He(II) photoelectron spectroscopy and ab initio calculations, *J. Organometal. Chem.* **194**, 83 (1980).
- [5318] Kondo, T., Tanimoto, M., Matsumoto, M., Nomoto, K., Achiba, Y., and Kimura, K. Cyclic peroxides: Dihedral angle around the peroxide bond by microwave and photoelectron spectroscopic studies, *Tetrahedron Letters* **21**, 1649 (1980).
- [5319] Bock, H., and Kaim, W. Reduktion R_3SiO -substituierter Benzol-Derivate, *Z. Anorg. Allg. Chem.* **459**, 103 (1979).
- [5320] Millefiori, S., Millefiori, A., Pignataro, S., Distefano, G., and Colonna, F. P. Gas phase UPS investigation of *trans*-azobenzenes, *Z. Naturforsch.* **34a**, 1496 (1979).
- [5321] Harris, D. H., and Spalding, T. R. Electron impact study of compounds with main group IV element to transition metal bonds, *Inorg. Chim. Acta* **39**, 187 (1980).
- [5322] Rademacher, P., Bass, V.-M., Wildemann, M., and Weger, H. Photoelektronenspektren und Konformation von Hydrazobenzolen, *Chem. Ber.* **110**, 1939 (1977).
- [5323] Colonna, F. P., Distefano, G., Guerra, M., Jones, D., and Modelli, A. Furyl- and thienyl-mercury derivatives studied by means of ultraviolet photoelectron spectroscopy. Evidence for the participation in bonding of the vacant $6p\pi$ orbitals of mercury in bis-2-furyl- and bis-2-thienylmercury, *J. Chem. Soc. Dalton*, 2037 (1979).
- [5324] Fehner, T. P., Wu, M., Meneghelli, B. J., and Rudolph, R. W. Ultraviolet photoelectron spectroscopy of thiaboranes, *Inorg. Chem.* **19**, 49 (1980).
- [5325] Martin, H.-D., and Heller, C. Synthese homokonjugierter Polyene: 2,4-Dimethylenbicyclo[3.2.0]oct-6-en und 2,5-Dimethylenbicyclo[4.2.0]non-7-en, *Monatsh. Chem.* **110**, 1271 (1979).
- [5326] Modelli, A., Innorta, G., and Torroni, S. He(I) UPS spectra of some α -diazoketones, *J. Electron Spectrosc. Relat. Phenom.* **18**, 359 (1980).
- [5327] Nixon, J. F., Suffolk, R. J., Taylor, M. J., Norman, J. G., Jr., Hoskins, D. E., and Gmur, D. J. Photoelectron and electronic spectra of $Rh_2Cl_2(CO)_4$ and $Rh_2Cl_2(PF_3)_4$. Assignments from SCF- $X\alpha$ -SW calculations, *Inorg. Chem.* **19**, 810 (1980).
- [5328] Zverev, V. V., Villem, Y. Y., Islamov, R. G., and Kitaev, Y. P. Photoelectron spectrum and electron structure of vinylphosphonic dichloride $Cl_2P(O)CH=CH_2$, *Zh. Obshch. Khim.* **49**, 1737 (1979).
- [5329] Colbourne, D., Frost, D. C., McDowell, C. A., and Westwood, N. P. C. The photoelectron spectra of the methylbromamines and unsubstituted bromamines, *Can. J. Chem.* **57**, 1279 (1979).
- [5330] Bernauer, O., Busse, B., and Weil, K. G. Massenspek-

- trometrische Untersuchungen an Kupfer- und Silberhalogeniden IV: Die Systeme $\text{Ag}, \text{Cu}_{1-X}\text{Cl}$ ($0 \leq X \leq 1$) und AgCl, Br_X ($0 \leq X \leq 1$). *Ber. Bunsenges. Phys. Chem.* **83**, 603 (1979).
- [5331] Gingerich, K. A., and Cocke, D. L. The atomization energies of ternary cerium-platinum metal monocarbides, *Inorg. Chim. Acta* **33**, L107 (1979).
- [5332] Kaim, W., and Bock, H. Radical ions XVII. Radical ions of tetrakis(trimethylsilyl)butatriene, *J. Organometal. Chem.* **164**, 281 (1979).
- [5333] English, A. M., Plowman, K. R., Butler, I. S., Diemann, E., and Müller, A. He(I) photoelectron spectra of pentacarbonyl(selenocarbonyl)chromium(0) and related complexes, *Inorg. Chim. Acta* **32**, 113 (1979).
- [5334] Wu, C. H., and Ihle, H. R. The existence of the molecule CLi_3 and its ionization potential, *Chem. Phys. Letters* **61**, 54 (1979).
- [5335] Martin, H.-D., Heller, C., Haider, R., Hoffmann, R. W., Becherer, J., and Kurz, H. R. Vertikale oder nicht-vertikale Stabilisierung im Pentacyclo-[4.3.0.0^{2,1}.0^{3,4}.0^{5,7}]non-9-yl-Kation? Das 9-Methylenpentacyclononan-Radikalkation, *Chem. Ber.* **110**, 3010 (1977).
- [5336] Weschke, W., Timpe, H.-J., and Just, G. Untersuchungen an EDA-Komplexen von Benzylarylethern, *J. Prakt. Chem.* **321**, 605 (1979).
- [5337] Mathur, B. P., Abbey, L. E., Burgess, E. M., and Moran, T. F. Doubly charged ion mass spectra, *Org. Mass Spectrom.* **15**, 312 (1980).
- [5338] Fragalà, I., Condorelli, G., Tondello, A., and Cassol, A. Photoelectron spectroscopy of f-element coordination compounds. I. β -diketonate complexes of uranium(IV), thorium(IV), zirconium(IV), and dioxouranium(VI), *Inorg. Chem.* **17**, 3175 (1978).
- [5339] Schmidt, H., Schweig, A., Thiel, W., and Jones, M., Jr. Photoelektronenspektren und MNDO-Rechnungen für [n]Paracyclophane, *Chem. Ber.* **111**, 1958 (1978).
- [5340] Sahini, V. E., Constantin, V., Serban, I., and Vlădescu, C. Electron impact-induced fragmentation of dibenzo[b,e]oxepin-11-one and dibenzo[b,e]thiepin-11-one, *Rev. Roum. Chim.* **23**, 163 (1978).
- [5341] Gotthardt, H., Reiter, F., Gleiter, R., and Bartetzko, R. Thieno[3,4-c]isothiazol. Synthese und Eigenschaften eines neuen nichtklassisch kondensierten Thiophens, *Chem. Ber.* **112**, 260 (1979).
- [5342] Rauh, E. G., and Ackermann, R. J. The first ionization potentials of the transition metals, *J. Chem. Phys.* **70**, 1004 (1979).
- [5343] Egdell, R. G., Palmer, M. H., and Findlay, R. H. Electronic structure of the group 5 oxides: Photoelectron spectra and ab initio molecular orbital calculations, *Inorg. Chem.* **19**, 1314 (1980).
- [5344] Asmus, P., and Klessinger, M. Wechselwirkung der Walsh-Orbitale in Bicyclopropyl, *Angew. Chem.* **88**, 343 (1976).
- [5345] McLoughlin, R. G., and Traeger, J. C. Heat of formation for *tert*-butyl cation in the gas phase, *J. Am. Chem. Soc.* **101**, 5791 (1979).
- [5346] Loch, R., and Momigny, J. Dissociative ionization by low energy electron impact. Energy distribution and appearance energy of doubly ionized fragments from N_2 and O_2 , *Chem. Phys. Letters* **66**, 574 (1979).
- [5347] Kroner, J., and Strack, W. Geometry and n-ionization energies of alkyl-substituted triketones, *Angew. Chem. Int. Ed.* **11**, 220 (1972).
- [5348] Greenhough, T. J., Kolthammer, B. W. S., Legzdins, P., and Trotter, J. Organometallic nitrosyl chemistry. 10. Synthesis, X-ray structural characterization, and properties of dicarbonyl (η^5 -cyclopentadienyl)(thionitrosyl)chromium, *Inorg. Chem.* **18**, 3548 (1979).
- [5349] Haque, R., and Gingerich, K. A. Investigation of the thermodynamic stabilities of the gaseous molecules RhScC , RhScC_2 and RhYC_3 by Knudsen effusion mass spectrometry, *J. Chem. Soc. Faraday Trans. II*, 985 (1979).
- [5350] Helm, H., Stephan, K., and Märk, T. D. Electronimpact ionization of Ar_2 , ArKr , Kr_2 , KrXe , and Xe_2 , *Phys. Rev. A* **19**, 2154 (1979).
- [5351] Jochims, H. W., Lohr, W., and Baumgärtel, H. Photoreactions of small organic molecules V. Absorption-, photoion- and resonancephotoelectronspectra of CF_3Cl , CF_2Cl_2 , CFCl_3 in the energy range 10–25 eV, *Ber. Bunsenges.* **80**, 130 (1976).
- [5352] Reinke, D., Baumgärtel, H., Cvitaš, T., Klasinc, L., and Güsten, H. Vergleich der Photoelektronenspektren und Photoionenspektren von Vinylfluorid, *Ber. Bunsenges.* **78**, 1145 (1974).
- [5353] Rademacher, P., and Koopman, H. Cyclische und bicyclische Hydrazine, *Chem. Ber.* **108**, 1557 (1975).
- [5354] Bowling, R. A., Sherrod, R. E., Bloor, J. E., Allen, J. D., Jr., and Schweitzer, G. K. He I photoelectron spectra of gaseous alkali nitrates, *Inorg. Chem.* **17**, 3418 (1978).
- [5355] Findlay, R. H., Palmer, M. H., Downs, A. J., Egdell, R. G., and Evans, R. Electronic structure of the sulfur nitrides. Ab initio calculations and photoelectron spectra, *Inorg. Chem.* **19**, 1307 (1980).
- [5356] Meunier, P., and Pfister-Guillouzo, G. Etude conformationnelle par spectroscopie photoélectronique de sulfures de bithiényle, *Can. J. Chem.* **55**, 3901 (1977).
- [5357] Green, J. C., Mingos, D. M. P., and Seddon, E. A. UV photoelectron spectral studies of carbonylhydrido-clusters and the development of a topological bonding model, *J. Organometal. Chem.* **185**, C20 (1980).
- [5358] Fabian, B. D., Fehlner, T. P., Hwang, L.-S.J., and Labinger, J. A. Allylic interactions in organometallics: Probing electronic structure in (η^5 - C_5H_5) $\text{Fe}(\text{CO})_2\text{R}$, $\text{R} = \text{CH}_3$, η^1 - C_3H_5 , η^1 - C_3H_7 , *J. Organometal. Chem.* **191**, 409 (1980).
- [5359] de Meijere, A. Dispiro[2.0.2.4]deca-7,9-dien und Vergleichsverbindungen: Darstellung, UV-, NMR- und Photoelektronen-spektroskopische Untersuchungen, *Chem. Ber.* **107**, 1684 (1974).
- [5360] Masclet, P., and Mouvier, G. Étude par spectrométrie photoélectronique d'aldéhydes et de cétones éthyléniques conjugués, *J. Electron Spectrosc. Relat. Phenom.* **14**, 77 (1978).
- [5361] Hemmersbach, P., and Klessinger, M. Der Einfluss von Wechselwirkungen durch den Raum und über Bindungen auf die Walsh-Orbitale von Spirocyclopropylverbindungen, *Tetrahedron* **36**, 1337 (1980).
- [5362] Hill, W. E., Ward, C. H., Webb, T. R., and Worley, S. D. Electronic structures of (alkene)iron tetracarbonyl compounds, *Inorg. Chem.* **18**, 2029 (1979).
- [5363] Frost, D. C., Kirby, C., Lau, W. M., MacDonald, C. A., McDowell, C. A., and Westwood, N. P. C. Thiocyanogen ($\text{SCN})_2$. Preparation, ultraviolet photoelectron spectrum and structure, *Chem. Phys. Letters* **69**, 1 (1980).
- [5364] Akiyama, I., Li, K. C., LeBreton, P. R., Fu, P. P., and Harvey, R. G. Ultraviolet photoelectron studies of polycyclic aromatic hydrocarbons. The ground-state electronic structure of aryloxiranes and metabolites of benzo[a]pyrene, *J. Phys. Chem.* **83**, 2997 (1979).
- [5365] Reineke, W., and Strein, K. Erzeugung eines methylenhaltigen Molekularstrahls durch Pyrolyse von Keten, *Ber. Bunsenges. Phys. Chem.* **80**, 343 (1976).
- [5366] Dube, G., and Gey, E. Das Verhalten disubstituierter Benzole $\text{RC}_6\text{H}_4\text{Si}(\text{CH}_3)_2\text{F}$ bei Elektronenstoß, *Org. Mass Spectrom.* **14**, 17 (1979).
- [5367] Worley, S. D., and Webb, T. R. The electronic structure of transition-metal carbonyl complexes of norbornadiene and mesitylene, *J. Organometal. Chem.* **192**, 139 (1980).

- [5368] Starzewski, K.-H. A. O., Richter, W., and Schmidbaur, H. Photoelektronenspektren und Struktur von Arsenyliden. P versus As: Ein Beitrag zur Problematik der ylidischen Bindung, *Chem. Ber.* **109**, 473 (1976).
- [5369] Delmas, M. A., and Maire, J. C. Conformation du cycle dithia-1,3 stanna-2 cyclopentane: etude par RMN ^1H et par spectroscopie photoelectronique, *J. Organometal. Chem.* **161**, 13 (1978).
- [5370] Dannacher, J. Photoelectron-photoion-coincidence measurements on 2,4-hexadiyne, *Chem. Phys.* **29**, 339 (1978).
- [5371] Dyke, J. M., Fayad, N. K., Morris, A., Trickle, I. R., and Allen, G. C. A study of the electronic structure of the actinide tetrahalides UF_4 , ThF_4 , UCl_4 , and ThCl_4 using vacuum ultraviolet photoelectron spectroscopy and SCF-X α scattered wave calculations, *J. Chem. Phys.* **72**, 3822 (1980).
- [5372] Martin, H.-D., Kunze, M., and Beckhaus, H.-D., Walsh, R., and Gleiter, R. Cis,trans-1,5-Cyclooctadien Thermolyse, Spannungsenergie und transannulare Wechselwirkungen, *Tetrahedron Letters* 3069 (1979).
- [5373] Böhm, M. C., Gleiter, R., Delgado-Pena, F., and Cowan, D. O. Photoelectron spectra of biferrocenylene and biferrocene, *Inorg. Chem.* **19**, 1081 (1980).
- [5374] Schwarz, H., Wesdemiotis, C., Hess, B., and Levsen, K. Massenspektrometrische Untersuchung organischer Stickstoffverbindungen, *Org. Mass Spectrom.* **10**, 595 (1975).
- [5375] Armentrout, P. B., and Beauchamp, J. L. Properties and reactions of uranium(IV) tetrahydroborate by ion cyclotron mass spectrometry, *Inorg. Chem.* **18**, 1349 (1979).
- [5376] Andreocci, M. V., Cauletti, C., Furlani, C., and King, R. B. UV photoelectron study of mononuclear metal complexes of methylaminobis(difluorophosphine), *Inorg. Chem.* **18**, 954 (1979).
- [5377] Kunz, H., Lindig, M., Bicker, R., and Bock, H. Intramolekulare Wasserstoffbrücken in sterisch fixierten Amino-alkoholen, *Chem. Ber.* **111**, 2282 (1978).
- [5378] Schäfer, W., and Schweig, A. Zur Konjugation in aromatischen Aminen und Phosphanen, *Angew. Chem.* **84**, 898 (1972).
- [5379] Sümmermann, W., and Deffner, U. Die elektrochemische Oxidation aliphatischer Nitroxyl-Radikale, *Tetrahedron* **31**, 593 (1975).
- [5380] Limouzin, Y., and Maire, J. C. Spectres photoelectroniques des composés organometalliques, *J. Organometal. Chem.* **105**, 179 (1976).
- [5381] Rademacher, P. Acyclische Hydrazine, *Chem. Ber.* **108**, 1548 (1975).
- [5382] Kaim, W., and Bock, H. R_2P - und R_2N -substituierte Benzole: Die Ladungsverteilung in ihren Kationen, Anionen und Trianionen, *Chem. Ber.* **111**, 3843 (1978).
- [5383] Nomoto, K., Achiba, Y., and Kimura, K. HeII(304 Å) photoelectron spectrum of N_2O_4 , *Chem. Phys. Letters* **63**, 277 (1979).
- [5384] Böhm, M. C., Gleiter, R., Morgan, G. L., Luszyk, J., and Starowieyski, K. B. Electronic structure of metallocenes V. Photoelectron spectra of cyclopentadienyl-beryllium compounds, *J. Organometal. Chem.* **194**, 257 (1980).
- [5386] Solouki, B., Rosmus, P., and Bock, H. Photoelektronen-Spektrum von $\text{HN}=\text{S}=\text{O}$, *Angew. Chem.* **88**, 381 (1976).
- [5387] Flitsch, W., Peeters, H., Schulten, W., and Rademacher, P. Photoelektronenspektren und Konformation von 1,1'-bipyrrylen, *Tetrahedron* **34**, 2301 (1978).
- [5388] Weiss, M. J., Hsieh, T.-C., and Meisels, G. G. Fragmentation of SO_2^+ prepared in state selected vibrational levels, *J. Chem. Phys.* **71**, 567 (1979).
- [5389] Guimon, C., Pfister-Guillouzo, G., Manuel, G., and Mazerolles, P. Structure électronique de sila-cyclopentenes-2 et-3, *J. Organometal. Chem.* **149**, 149 (1978).
- [5390] Dehmlow, E. V., Dehmlow, S. S., and Marschner, F. Chemische und photoelektronenspektroskopische Eigenschaften von cyclopropylsubstituierten Cyclopropenonen, *Chem. Ber.* **110**, 154 (1977).
- [5391] Gupta, S. K., and Gingerich, K. A. Knudsen effusion mass spectrometric determination of the dissociation energy of diniobium, $\text{Nb}_2(\text{g})$, and the heat of sublimation of solid niobium, *J. Chem. Phys.* **70**, 5350 (1979).
- [5392] Böhm, M. C., and Gleiter, R. Das He(I)-Photoelektronenspektrum von 1,2,6,7-Cyclodecatetraen. Hinweis auf eine starke transannulare Wechselwirkung, *Chem. Ber.* **111**, 3516 (1978).
- [5393] Wu, C. H., Ihle, H. R., and Zmbov, K. Atomization energies of the molecules $\text{LiSiO}(\text{g})$ and $\text{Si}_2\text{O}_2(\text{g})$ by mass spectrometric gaseous equilibria, *J. Chem. Soc. Faraday II* **76**, 447 (1980).
- [5394] Cauletti, C., Green, J. C., Kelly, M. R., Powell, P., and Van Tilborg, J. Photoelectron spectra of metallocenes, *J. Electron Spectrosc. Relat. Phenom.* **19**, 327 (1980).
- [5395] Jorgensen, F. S., and Snyder, J. P. Search for a trans-disulfide: Structural analysis of di-tertadamantyl disulfide by photoelectron spectroscopy, derivation of $\sigma_1(t\text{-Ad})$, and molecular mechanics calculations for related bulky disulfides, *J. Org. Chem.* **45**, 1015 (1980).
- [5396] Kovač, B., Klasinc, L., Stanovnik, B., and Tišler, M. Photoelectron spectroscopy of heterocycles. Azaindenes and azaindolizines (I), *J. Heterocycl. Chem.* **17**, 689 (1980).
- [5397] Dougherty, D., Lewis, J., Nauman, R. V., and McGlynn, S. P. Photoelectron spectroscopy of azulenes, *J. Electron Spectrosc. Relat. Phenom.* **19**, 21 (1980).
- [5398] Rankin, D. W. H., and Wright, J. G. Preparation and properties of difluorophosphino(tetrafluorophosphoranyl)amine, *J. Chem. Soc. Dalton*, 1070 (1979).
- [5399] Schenk, H., Oertel, H., and Baumgärtel, H. Photoreactions of small organic molecules VII Photoionization studies on the ion-pair formation of the fluorochloromethanes CF_2Cl_2 , CF_3Cl , and CFCl_3 , *Ber. Bunsenges. Phys. Chem.* **83**, 683 (1979).
- [5400] Audier, H.-E., Fetizon, M., Henry, Y., and Prange, T. Mécanismes de fragmentation de l'oxazole, *Org. Mass Spectrom.* **11**, 1047 (1976).
- [5401] Grützmacher, H.-F., and Lange, G. Untersuchungen zur synchronen oder zweistufigen Fragmentierung der Molekül-Ionen von 3-substituierten Tropanen, *Chem. Ber.* **111**, 1962 (1978).
- [5403] Chmutova, G. A., Vtyurina, N. N., Komina, T. V., Gazizov, I. G., and Bock, H. Molecular-orbital characteristics of anisole isologs $\text{X}-\text{C}_6\text{H}_4-\text{ECH}_3$ ($\text{E} = \text{O}, \text{S}, \text{Se}$) containing donor substituents X, *Zh. Obshch. Khim.* **49**, 192 (1979).
- [5404] Dannacher, J., Heilbronner, E., Stadelmann, J.-P., and Vogt, J. 225. Fragmentation of energy selected butadiyne- and 1,3-pentadiyne radical cations, *Helv. Chim. Acta* **62**, 2186 (1979).
- [5405] Mellink, W. A., and Janssen, M. J. Photoelectron spectra of aromatic sulphides and sulphones, *J. Chem. Res.(S)*, 422 (1978).
- [5406] Nakagaki, R., Kobayashi, T., and Nagakura, S. Conformations of acetanilide and related compounds studied by ultraviolet photoelectron spectroscopy, *Bull. Chem. Soc. Jpn.* **53**, 901 (1980).
- [5407] Carlier, P., Mouvier, G., Mesnard, D., and Miginiac, L. Etude par spectrométrie de photoelectrons de la structure électronique de enynes conjugués, *J. Electron Spectrosc. Relat. Phenom.* **16**, 147 (1979).
- [5408] Sell, J. A., Mintz, D. M., and Kupperman, A. Photoelectron

- angular distributions of carbon- carbon pi electrons in ethylene, benzene, and their fluorinated derivatives, *Chem. Phys. Letters* **58**, 601 (1978).
- [5409] Carlier, P., and Mouvier, G. Etude par spectrometrie de photoelectrons de la structure electronique des phenylalcyne conjugues, *J. Electron Spectrosc. Relat. Phenom.* **16**, 169 (1979).
- [5410] Guimon, C., Pfister-Guillouzo, G., and Arbelot, M. Spectres photoelectroniques de la dithiole-1,3- thione-2 et de son derive benzosubstitue, *J. Mol. Struct.* **30**, 339 (1976).
- [5411] Bieri, G., Burger, F., Heilbronner, E., and Maier, J. P. 223. Valence ionization energies of hydrocarbons, *Helv. Chim. Acta* **60**, 2213 (1977).
- [5412] Trott, W. M., Blais, N. C., and Walters, E. A. Molecular beam photoionization study of acetone and acetone-d₆, *J. Chem. Phys.* **69**, 3150 (1978).
- [5413] Zaretskii, Z. V. I.: Oren, D., and Kelner, L. Automatic method for the measurement of the electron impact ionization and appearance potentials, *Appl. Spectrosc.* **30**, 366 (1976).
- [5414] Sahini, V. E., Constantin, V., Serban, I., and Vladescu, C. Electron-impact-induced fragmentation of some dibenzo[b, e] thiepin, *Rev. Roum. Chim.* **23**, 315 (1978).
- [5415] Guimon, M. F., Guimon, C., Metras, F., and Pfister-Guillouzo, G. Analyse conformationnelle de trithiolanes-1,2,4, Can. *J. Chem.* **54**, 146 (1976).
- [5416] Laerum, T., and Undheim, K. N-Quaternary compounds. Part 52. Photochemically induced valence bond isomerism and rearrangement to pyridinones of thiazolo[3,2-a]-pyridinium-8-olate derivatives, *J. Chem. Soc. Perkin Trans. 1*, 1150 (1978).
- [5417] Goetz, H., Marschner, F., Juds, H., and Pohle, H. Korrelation zwischen pK_s-Werten und vertikalen Ionisationspotentialen I_v bei p-X-Phenyl-dicyclohexyl-phosphinen, *Phosphorus* **6**, 137 (1976).
- [5419] Demuth, R. Photoelektronenspektren von einigen Trihalogensilylphosphanen und -arsanen X₃SiER₂ (X = F, Cl; E = N, P, As; R = H, CH₃), *Z. Naturforsch.* **32b**, 1252 (1977).
- [5420] Brown, R. S., Marcinko, R. W., and Tse, A. Application of photoelectron spectroscopy to substituent effects. Conformational analysis of some flexible allylic ethers and alcohols, *Can. J. Chem.* **57**, 1890 (1979).
- [5421] Gey, E., and Dube, G. Die Ionisierungsenergien von substituierten Phenylmethylmethoxysilanen und Phenylmethylfluorsilanen, *Int. J. Mass Spectrom. Ion Phys.* **22**, 103 (1976).
- [5422] Meunier, P., and Pfister-Guillouzo, G. Etude conformationnelle par spectroscopie photoelectronique de dihydro "epinnes", *Can. J. Chem.* **55**, 2867 (1977).
- [5423] Efraty, A., Liebman, D., Huang, M. H. A., Weston, C. A., and Angelici, R. J. Mass spectra of organo- metallic compounds. 7. Electron-impact study of some cyclopentadienylmetal thiocarbonyl-bridged dimers, *Inorg. Chem.* **17**, 2831 (1978).
- [5424] Alikhanyan, A. S., Steblevskii, A. V., Malkerova, I. P., Pervov, V. S., Butskii, V. D., and Gorgoraki, V. I. Mass spectrometric study of the sublimation of molybdenum trifluoride, *Russ. J. Inorg. Chem.* **23**, 814 (1978).
- [5425] Dyke, J. M., Jonathan, N., Mills, J. D., and Morris, A. Vacuum ultraviolet photoelectron spectroscopy of transient species Part 12. The FO(X²II_g) radical, *Mol. Phys.* **40**, 1177 (1980).
- [5426] Neubert, A., Ihle, H. R., and Gingerich, K. A. Thermodynamic study of the molecules BiLi and PbLi by Knudsen effusion mass spectrometry, *J. Chem. Phys.* **73**, 1406 (1980).
- [5427] Schäfer, W., and Schweig, A. C - S Hyperconjugation, *Tetrahedron Letters*, 5205 (1972).
- [5428] Cabaud, B., Hoareau, A., and Melinon, P. Time-of-flight spectroscopy of a supersonic beam of mercury. Intensities and appearance potentials of Hg_n aggregates, *J. Phys. D.* **13**, 1831 (1980).
- [5429] Bohlmann, F., Köppel, C., Müller, B., Schwarz, H., and Weyerstahl, P. Massenspektrometrische Untersuchung isomerer Kohlenwasserstoffe: Struktur und Bildungsenthalpie stabiler (C₁₃H₁₁⁺)-Ionen, *Tetrahedron* **30**, 1011 (1974).
- [5430] Cooper, C. D., Williamson, A. D., Miller, J. C., and Compton, R. N. Resonantly enhanced multiphoton ionization of pyrrole, N-methyl pyrrole, and furan, *J. Chem. Phys.* **73**, 1527 (1980).
- [5431] Bally, T., and Haselbach, E. 65. Tris(methylidene)-cyclopropane("3radialene"). Part 2. Electronic states of the molecular cation and revised uv- absorption spectrum of the parent neutral, *Helv. Chim. Acta* **61**, 754 (1978).
- [5432] Allan, M., Dannacher, J., and Maier, J. P. Radiative and fragmentation decay of the cations of *trans*- and *cis* 1,3,5-hexatriene and of all *trans*-1,3,5-heptatriene in the A(II⁻) states, studied by emission and photoelectron-photoion coincidence spectroscopy, *J. Chem. Phys.* **73**, 3114 (1980).
- [5433] Lee, E. P. F., Law, D., and Potts, A. W. Photoelectron spectra and valence shell electronic structure of zinc and cadmium difluoride, *J. Chem. Soc. Faraday II* **76**, 1314 (1980).
- [5434] Alikhanyan, A. S., Steblevskii, A. V., Pervov, V. S., Butskii, V. D., and Gorgoraki, V. I. Mass-spectrometric study of molybdenum oxide fluorides, *Russ. J. Inorg. Chem.* **23**, 1412 (1978).
- [5435] Coppens, P., Reynaert, J. C., and Drowart, J. Mass spectrometric study of the photoionization of carbon disulphide in the wavelength interval 125-60nm, *J. Chem. Soc. Faraday II* **75**, 292 (1979).
- [5436] Jongsma, C., Vermeer, H., Bickelhaupt, F., Schäfer, W., and Schweig, A. 10-methyl-9-phosphaanthracene, *Tetrahedron* **31**, 2931 (1975).
- [5437] Matyuk, V. M., Potapov, V. K., and Prokhoda, A. L. Photoexcitation and photoionisation of nitro- derivatives of benzene and toluene, *Russ. J. Phys. Chem.* **53**, 538 (1979).
- [5438] Weiner, M. A., Lattman, M., and Grim, S. O. Ultraviolet photoelectron spectra of some substituted triarylphosphines, *J. Org. Chem.* **40**, 1292 (1975).
- [5439] Ono, Y., Linn, S. H., Prest, H. F., Gress, M. E., and Ng, C. Y. Molecular beam photoionization study of carbon disulfide, carbon disulfide dimer and clusters, *J. Chem. Phys.* **73**, 2523 (1980).
- [5440] Malkerova, I. P., Alikhanyan, A. S., Pervov, V. S., Tripol'skaya, T. A., Gorgoraki, V. I., and Malyusov, V. A. High-temperature investigations of chromium lower fluorides, *Russ. J. Inorg. Chem.* **24**, 1775 (1979).
- [5441] Bischof, P., Gleiter, R., Taylor, R. T., Browne, A. R., and Paquette, L. A. Electronic structure of tricyclo[4.1.0.0^{2,7}]hept-3-enes. Correlation with the regioselectivity of electrophilic attack, *J. Org. Chem.* **43**, 2391 (1978).
- [5442] Starzewski, K. A. O., and Dieck, H. t. Electronic structure and reactivity. 8. Iminophosphoranes simple ylides analogues? An investigation of quantitative and phenomenological differences, *Inorg. Chem.* **18**, 3307 (1979).
- [5443] Allen, C. W., and Green, J. C. Organophosphazenes. 12. He I photoelectron spectra of selected phenyl- and [p-(dimethylamino)phenyl]fluorocyclotriphosphazenes, *Inorg. Chem.* **19**, 1719 (1980).
- [5444] Müller, C., Schweig, A., and Vermeer, H. Methode zur Berechnung induktiver und konjugativer Effekte -

- Andwendung auf Tropon, *Angew. Chem.* **86**, 275 (1974).
- [5445] Holmes, J. L., Terlouw, J. K., and Burgers, P. C. $[C_3H_3O]^+$ ions; Reacting and non-reacting configurations, *Org. Mass Spectrom.* **15**, 140 (1980).
- [5446] Cauletti, C., and Sima, J. The electronic structure of some N,N' -ethylenebis(thioacetylacetoneimino) complexes studied by uv photoelectron spectroscopy, *J. Electron Spectrosc. Relat. Phenom.* **19**, 1 (1980).
- [5447] Bischof, P., Böhm, M., Gleiter, R., Snow, R. A., Doecke, C. W., and Paquette, L. A. Evaluation of through-space interaction in 9-substituted pentacyclononane derivatives, *J. Org. Chem.* **43**, 2387 (1978).
- [5448] Simonneaux, G., Jaouen, G., Dabard, R., and Guenot, P. Contribution a l'étude des métaux asymétriques IV. Etude des complexes areniques du chrome(o) par spectroscopie de masse: modes de liaison du métal avec divers ligands a deux électrons: phosphines, phosphites, carbonyle et thiocarbonyle, *J. Organometal. Chem.* **132**, 231 (1977).
- [5449] Brown, C. M., Tilford, S. G., and Ginter, M. L. Absorption spectrum of Pb I between 1350 and 2041 Å, *J. Opt. Soc. Am.* **67**, 1240 (1977).
- [5450] Brown, C. M., Tilford, S. G., and Ginter, M. L. Absorption spectra of Zn I and Cd I in the 1300–1750 Å region, *J. Opt. Soc. Am.* **65**, 1404 (1975).
- [5451] Zaikin, V. G., Musaev, I. A., and Kurashova, E. K. Ionization and appearance potentials in organic chemistry, *Org. Mass Spectrom.* **13**, 685 (1978).
- [5452] Zaikin, V. G., and Wulfson, N. S. Dissociation energies of axial and equatorial carbon-carbon bonds in substituted decahydroquinolols, *Tetrahedron Letters*, 2935 (1978).
- [5453] Müller, J., Fenderl, K., and Mertschenk, B. Die Donor-Akzeptor-Eigenschaften des Liganden Trifluorphosphin in Übergangsmetallkomplexen, *Chem. Ber.* **104**, 700 (1971).
- [5454] Rosenstock, H. M., McCulloh, K. E., and Lossing, F. P. On the mechanisms of C_6H_6 ionization and fragmentation, *Intern. J. Mass Spectrom. Ion Phys.* **25**, 327 (1977).
- [5455] McLean, W., Murray, P. T., Baer, T., and Jarnagin, R. C. Dissociative photoionization of *t*-butyl-lithium, *J. Chem. Phys.* **69**, 2715 (1978).
- [5456] Bavia, M., Zauli, C., and Fusina, L. Rydberg states in selenophen, *Mol. Phys.* **30**, 1289 (1975).
- [5457] Bieri, G., and Jonsson, B.-Ö. HNC^+ radical cation studied by charge-exchange mass spectrometry, *Chem. Phys. Letters* **56**, 446 (1978).
- [5458] Vogt, J., Williamson, A. D., and Beauchamp, J. L. Properties and reactions of ketene in the gas phase by ion cyclotron resonance spectroscopy and photoionization mass spectrometry. Proton affinity, site specificity of protonation, and heat of formation of ketene, *J. Am. Chem. Soc.* **100**, 3478 (1978).
- [5459] Schubert, R., and Grützmacher, H.-F. Kinetic energy release and position of transition state during the intramolecular substitution of ionized 2-benzoyl pyridines, *Org. Mass Spectrom.* **15**, 122 (1980).
- [5460] Vajda, J. H., and Harrison, A. G. Proton affinities of some olefinic carbonyl compounds and heats of formation of $C_nH_{2n-1}O^+$ ions, *Intern. J. Mass Spectrom. Ion Phys.* **30**, 293 (1979).
- [5461] Maier, J. P., Marthaler, O., and Mohraz, M. Decay of some substituted benzene cations in the B states in the gaseous phase, *J. Chim. Phys.* **77**, 661 (1980).
- [5462] Baldwin, M. A., Loudon, A. G., Dunmur, R. E., Schmutzler, R., and Gregor, I. K. Charge location and fragmentation under electron impact, *Org. Mass Spectrom.* **12**, 275 (1977).
- [5463] Kovač, B., Heilbronner, E., Prinzbach, H., and Weidmann, K. 288. The photoelectron spectra of D_{2d} and C_{2v} hydrocarbons containing two norbornadiene or quadricyclane groups, *Helv. Chim. Acta* **62**, 2841 (1979).
- [5465] Bell, S., Ng, T. L., and Walsh, A. D. Vacuum ultraviolet spectra of formic and acetic acids, *J. Chem. Soc. Faraday Trans. II* **71**, 393 (1975).
- [5466] De Leeuw, D. M., Mooyman, R., and DeLange, C. A. He(I) photoelectron spectroscopy of transient species: The SBr_2 molecule, *Chem. Phys. Letters* **61**, 191 (1979).
- [5467] Solka, B. H., and Russell, M. E. Energetics of formation of some structural isomers of gaseous $C_2H_3O^+$ and $C_2H_6N^+$ ions, *J. Phys. Chem.* **78**, 1268 (1974).
- [5468] Murad, E., and Hildenbrand, D. L. Thermochemical properties of gaseous EuO, *J. Chem. Phys.* **65**, 3250 (1976).
- [5469] Peel, J. B., and Willett, G. D. Photoelectron spectra of the allyl amines, *Chem. Phys. Letters* **38**, 479 (1976).
- [5470] Doucet, J., Gilbert, R., Sauvageau, P., and Sandorfy, C. Photoelectron and far-ultraviolet spectra of CF_3Br , CF_2BrCl , and CF_2Br_2 , *J. Chem. Phys.* **62**, 366 (1975).
- [5471] Hildenbrand, D. L. Mass spectrometric studies of the thermochemistry of gaseous TiO and TiO_2 , *Chem. Phys. Letters*, **44**, 281 (1976).
- [5472] Padva, A., LeBreton, P. R., Dinerstein, R. J., and Ridyard, J. N. A. UV photoelectron studies of biological pyrimidines: The electronic structure of uracil, *Biochem. Biophys. Res. Commun.* **60**, 1262 (1974).
- [5473] Lee, T. H., and Rabalais, J. W. Model for spin-orbit interactions with inclusion of *d* electrons: Applications to photoelectron spectroscopy, *J. Chem. Phys.* **60**, 1172 (1974).
- [5474] Streets, D. G., Hall, W. E., and Ceasar, G. P. Mesomeric mixing in the π energy levels of aminobenzenes studied by photoelectron spectroscopy, *Chem. Phys. Letters* **17**, 90 (1972).
- [5475] Berkowitz, J. PES of high temperature vapors. VII. S_2 and Te_2 , *J. Chem. Phys.* **62**, 4074 (1975).
- [5476] Kitagawa, S., Morishima, I., Yonezawa, T., and Sato, N. Photoelectron spectroscopic study on metallo-octaethylporphyrins, *Inorg. Chem.* **18**, 1345 (1979).
- [5477] Worley, S. D., Hargis, J. H., Chang, L., Mattson, G. A., and Jennings, W. B. A study of the electronic structure of 2-(dialkyl-amino)-1,3-dimethyl-1,3,2-diazaphospholanes and related molecules, *Inorg. Chem.* **18**, 3581 (1979).
- [5478] Coustale, M., Guimon, C., Arriau, J., and Pfister-Guillouzo, G. Spectres photoélectroniques de divers thiéno[2,3-*b*] thiophènes, *J. Heterocyclic Chem.* **13**, 231 (1976).
- [5479] Rabalais, J. W., Debies, T. P., Berkosky, J. L., Huang, J.-T.J., and Ellison, F. O. Calculated photoionization cross sections and relative experimental photoionization intensities for a selection of small molecules, *J. Chem. Phys.* **61**, 516 (1974).
- [5480] Bischof, P., Gleiter, R., Dürr, H., Ruge, B., and Herbst, P. Das Photoelektronenspektrum von 1,2-Diäthylspiro[2.4]hepta-1,4,6-trien. Beispiel für eine π - σ -Wechselwirkung, *Chem. Ber.* **109**, 1412 (1976).
- [5481] Barraclough, P., Bilgic, S., Pedley, J. B., Rogers, A. J., and Young, D. W. Conjugative and homo-conjugative effects in 2-heterobicyclo[3.2.1]octa-3, 6-dienes, *Tetrahedron* **35**, 99 (1979).
- [5482] Chesnavich, W. J., Su, T., and Bowers, M. T. Reactions of vibrationally excited ions. A theoretical and experimental analysis of the reaction $(C_4H_9^+) + NH_3 \rightarrow NH_4^+ + C_4H_8$, *J. Am. Chem. Soc.* **100**, 4362 (1978).
- [5483] Wolkoff, P., Holmes, J. L., and Lossing, F. P. On the formation of cyclopentenium cations from all $C_5H_{10}^+$ molecular ion structures, *Can. J. Chem.* **58**, 251 (1980).
- [5484] Schwarz, H., Petersen, R. D., and Van De Sande, C. C. Entropische und energetische Effekte bei der Bildung cyclischer Oxonium-, Sulfonium- und Bromonium-Ionen aus ω -substituierten Phenoxyalkanen, *Org. Mass Spectrom.* **12**, 391 (1977).

- [5485] Berger, H.-O., Kroner, J., and Nöth, H. Die BorHalogen-Bindung in Methylhalogenboranen: Photoelektronenspektren und ab initio-Rechnungen, *Chem. Ber.* **109**, 2266 (1976).
- [5486] Akaba, R., Tokumaru, K., Kobayashi, T., and Utsunomiya, C. Electronic structures and conformations of *N*-benzylideneanilines. II. Photoelectron spectral study, *Bull. Chem. Soc. Japan* **53**, 2002 (1980).
- [5487] Maquestiau, A., Van Haverbeke, Y., Flammang, R., and Cooks, R. G. Fragmentation d'azoles sous l'impact électronique, *Org. Mass Spectrom.* **10**, 946 (1975).
- [5488] Holzmann, G., Rothkopf, H. W., Müller, R., and Wöhrle, D. Massenspektren heteroaromatischer Nitrile, *Org. Mass Spectrom.* **10**, 97 (1975).
- [5489] Rademacher, P., Breier, H., and Poppek, R. Photoelektronenspektren und Konformationen bi- und tricyclischer Hexahydro-1,2,4,5-tetrazine, *Chem. Ber.* **112**, 853 (1979).
- [5490] Gaivoronskii, P. E., Gavrichchuk, E. M., Chernyaev, N. P., and Zverev, Y. B. Mass spectrometric study of tris(isopropylcyclopentadienyl) π - complexes of lanthanum, praseodymium, and neodymium, *Russ. J. Inorg. Chem.* **23**, 1742 (1978).
- [5491] Loutfy, R. O., Still, I. W. J., Thompson, M., and Leong, T. S. Correlation of the photoelectron and electronic spectra of thiochromones and thiochromanones with their electrochemical data, *Can. J. Chem.* **57**, 638 (1979).
- [5492] Lin, J., Yu, C., Peng, S., Akiyama, I., Li, K., Lee, L. K., LeBreton, P. R. Ultraviolet photoelectron studies of the ground-state electronic structure and gas-phase tautomerism of purine and adenine, *J. Am. Chem. Soc.* **102**, 4627 (1980).
- [5493] Grützmacher, H.-F., and Schubert, R. Substituent effects in the mass spectra of benzoyl hetarenes, *Org. Mass Spectrom.* **14**, 567 (1979).
- [5494] Brown, C. M., and Ginter, M. L. Absorption spectrum of Ag I between 1540 and 1850 Å, *J. Opt. Soc. Am.* **67**, 1323 (1977).
- [5495] Brown, C. M., Tilford, S. G., and Ginter, M. L. Absorption spectrum of Ge I between 1500 and 1900 Å, *J. Opt. Soc. Am.* **67**, 584, 1977.
- [5496] Brown, C. M., Tilford, S. G., and Ginter, M. L. Absorption spectrum of Sn I between 1580 and 2040 Å, *J. Opt. Soc. Am.* **67**, 607 (1977).
- [5497] Brown, C. M., and Ginter, M. L. Absorption spectrum of Mn I between 1305 and 2040 Å, *J. Opt. Soc. Am.* **68**, 1541 (1978).
- [5499] Behan, J. M., Johnstone, R. A. W., Worman, J. J., and Fehlner, T. P. Photoelectron spectroscopy (HeI) of the dithione, bisimine and monoimine of tetramethyl-1,3-cyclobutanedione, *J. Mol. Struct.* **40**, 151 (1977).
- [5500] Brown, C. M., and Ginter, M. L. Absorption spectrum of Au I between 1300 and 1900 Å, *J. Opt. Soc. Am.* **68**, 243 (1978).
- [5501] Berman, D. W., Anicich, V., and Beauchamp, J. L. Stabilities of isomeric halonium ions $C_2H_4X^+$ ($X=Cl, Br$) by photoionization mass spectrometry and ion cyclotron resonance spectroscopy. General considerations of the relative stabilities of cyclic and acyclic isomeric onium ions, *J. Am. Chem. Soc.* **101**, 1239 (1979).
- [5502] Ellingsen, P., and Hvistendahl, G. Mass spectrometry of the simple *N*-vinylpyridinium salts, *Org. Mass Spectrom.* **15**, 18 (1980).
- [5503] Finney, C. D., and Harrison, A. G. A third-derivative method for determining electron-impact onset potentials, *Intern. J. Mass Spectrom. Ion Phys.* **9**, 221 (1972).
- [5504] Bock, H., Kaim, W., Nöth, H., and Semkow, A. Radical ions. 36. Structural changes accompanying the one-electron oxidation of hydrazine and its silyl derivatives, *J. Am. Chem. Soc.* **102**, 4421 (1980).
- [5505] Kotov, B. V., and Potapov, V. K. Ionization potentials of strong organic electron acceptors, *Khim. Vys. Energ.* **6**, 375 (1972).
- [5506] Karlsson, L., Mattson, L., Jadrny, R., Albridge, R. G., Pinchas, S., Bergmark, T., and Siegbahn, K. Isotopic and vibronic coupling effects in the valence electron spectra of $H_2^{16}O$, $H_2^{18}O$, and $D_2^{16}O$, *J. Chem. Phys.* **62**, 4745 (1975).
- [5507] Evans, S., Green, M. L. H., Jewitt, B., King, G. H., and Orchard, A. F. Electronic structures of metal complexes containing the π -cyclopentadienyl and related ligands, *J. Chem. Soc. Faraday II*, **70**, 356 (1974).
- [5508] Isakov, L. I., and Potapov, V. K. Dissociative photoionization of *n*-alkylamines, *Khim. Vys. Energ.* **5**, 534 (1971).
- [5509] Berkowitz, J., Batson, C. H., and Goodman, G. L. Photoionization of lithium chloride vapors: The structure and stability of alkali halide molecules and ions, *J. Chim. Phys.* **77**, 631 (1980).
- [5510] Vovna, V. I., and Vilesov, F. I. Photoelectron spectra and the structure of molecular orbitals of methyl amines, *Opt. Spectrosc.* **36**, 251 (1974).
- [5511] Smith, G., and Tomkins, F. S. Autoionization resonances in the Eu I absorption spectrum and a new determination of the ionization potential, *Proc. Roy. Soc. Lond.* **A342**, 149 (1975).
- [5512] Potapov, V. K., and Sorokin, V. V. Kinetic energies of products of dissociative photoionization of molecules. I. Aliphatic ketones and alcohols, *Khim. Vys. Energ.* **6**, 387 (1972).
- [5513] Selim, E. T. M., and El-Kholy, S. B. Mass spectrometric ionization and dissociation of methane, *Indian J. Pure Appl. Phys.* **13**, 233 (1975).
- [5514] Vovna, V. I., Lopatin, S. N., Pettsold, R., Vilesov, F. I., and Akopyan, M. E. Photoelectron spectra of a number of substitution products of thiophosphoryl chloride, *Opt. Spectrosc.* **36**, 99 (1974).
- [5515] Akopyan, M. E., Vilesov, F. I., and Lopatin, S. N. Photoionization of benzyl chloride, *Khim. Vys. Energ.* **6**, 110 (1972).
- [5516] Hodges, R. V., McDonnell, T. J., and Beauchamp, J. L. Properties and reactions of trimethyl phosphite, trimethyl phosphate, triethyl phosphate, and trimethyl phosphorothionate by ion cyclotron resonance spectroscopy, *J. Am. Chem. Soc.* **102**, 1327 (1980).
- [5517] Arnett, J. F., Newkome, G., Mattice, W. L., and McGlynn, S. P. Excited electronic states of the α -dicarbonyls, *J. Am. Chem. Soc.* **96**, 4385 (1974).
- [5518] Lichtenberger, D. L., and Fenske, R. F. Electronic structure of transition metal thiocarbonyl complexes, *Inorg. Chem.* **15**, 2015 (1976).
- [5519] Hernandez, R., Masclet, P., and Mouvier, G. Spectroscopie de photoelectrons d'aldehydes et de cetonas aliphatiques, *J. Electron Spectrosc. Relat. Phenom.* **10**, 333 (1977).
- [5520] Tschmutowa, G., and Bock, H. Photoelektronen-Spektren und Moleküleigenschaften, LXIII Ionisierungsenergien von Phenyl-Methyl-Tellurid und Vergleich der Effekte von Sauerstoff-, Schwefel-, Selen- und Tellur-Substituenten auf das Benzol- π -System, *Z. Naturforsch.* **31b**, 1611 (1976).
- [5521] Maier, J. P., Marthaler, O., and Mohraz, M. Decay of some substituted benzene cations in the B states in the gaseous phase, *J. Chim. Phys.* **77**, 661 (1980).
- [5522] Güsten, H., Klasinc, L., and Rušćić, B. Photoelectron spectroscopy of heterocycles. Indene analogs, *Z. Naturforsch.* **31a**, 1051 (1976).
- [5523] Elbel, S., and Dieck, H. t. Photoelectron spectra of group 5 compounds. Part V. Phosphorus halides, $R_2P(X)Y$ and $RP(X)Y_2$ ($R=Me$ or F ; $X=O, S$, or Se ; $Y=Cl$ or Br), *J. Chem. Soc. Dalton* 1762 (1976).
- [5525] Åsbrink, L., Von Niessen, W., and Bieri, G. 30.4-nm He(II)

- photoelectron spectra of organic molecules, *J. Electron Spectrosc. Relat. Phenom.* **21**, 93 (1980).
- [5526] Weiner, M. A., and Lattman, M. Ultraviolet photoelectron spectra of some $\text{Cr}(\text{CO})_5\text{L}$ complexes containing organosulfide and organophosphine ligands, *Inorg. Chem.* **17**, 1084 (1978).
- [5527] Ramsey, B. G., and Walker, F. A. A linear relationship between substituted pyridine lone pair vertical ionization potentials and $\text{p}K_a$, *J. Am. Chem. Soc.* **96**, 3314 (1974).
- [5528] Al-Khafaji, J. A., and Shanshal, M. The photoelectron spectra of cyclopropyl ketones, *Z. Naturforsch.* **32a**, 109 (1977).
- [5529] Elbel, S., and Dieck, H. t. Photoelectron spectra of group 5 compounds. Part IV. A study of the E-X bond in R_3EX compounds ($\text{R}=\text{Me}$ or F ; $\text{E}=\text{N}$ or P ; $\text{X}=\text{O}$ or S), *J. Chem. Soc. Dalton* 1757 (1976).
- [5530] Van den Ham, D. M. W., Van der Meer, D., and Feil, D. Photoelectron spectra of fluorine-substituted diazabenzenes, *J. Electron Spectrosc. Relat. Phenom.* **3**, 479 (1974).
- [5531] Trofimov, B. A., Mel'der, U. K., Pikver, R. I., and Vyalykh, E. P. Ionization potentials of unsaturated sulfides and the participation of neighboring multiple bonds of heteroatoms in the stabilization of the radical cation, *Teor. Eksp. Khim.* **11**, 129 (1975).
- [5532] Remane, H., Graefe, J., and Herzsuh, R. Ionisationspotentiale von cis- und trans- Cycloalkenen, *Z. Chem.* **12**, 194 (1972).
- [5534] Süzer, S., Banna, M. S., and Shirley, D. A. Relativistic and correlation effects in the 21.2-eV photoemission spectrum of atomic lead, *J. Chem. Phys.* **63**, 3473 (1975).
- [5535] Bock, H., and Kaim, W. Radical ions. 37. Ionization and one-electron oxidation of electron-rich silylalkyl olefins, *J. Am. Chem. Soc.* **102**, 4429 (1980).
- [5536] Van Dam, H., Louwen, J. N., Oskam, A., Doran, M., and Hillier, I. H. The electronic structure of dinuclear transition-metal complexes containing metal-metal interactions, *J. Electron Spectrosc. Relat. Phenom.* **21**, 57 (1980).
- [5537] Heilbronner, E., and Jones, T. B. Spectral differences between "isospectral" molecules, *J. Am. Chem. Soc.* **100**, 6506 (1978).
- [5538] Kobayashi, T. A new rule for photoelectron angular distributions of molecules, *Phys. Letters* **69A**, 31 (1978).
- [5539] Daamen, H., Boxhoorn, G., and Oskam, A. U. V. photoelectron (He I and He II) studies of $\text{M}(\text{CO})_5\text{PX}_3$ ($\text{M}=\text{Cr}, \text{Mo}, \text{W}$ and $\text{X}=\text{F}, \text{Cl}, \text{Br}$) *Inorg. Chim. Acta* **28**, 263 (1978).
- [5540] Daamen, H., and Oskam, A. Bonding properties of some monosubstituted chromium and tungsten hexacarbonyls $\text{M}(\text{CO})_5\text{L}$ ($\text{L}=\text{amine, substituted pyridine, azine}$), *Inorg. Chim. Acta* **26**, 81 (1978).
- [5541] Kirby, C., and Kroto, H. W. Microwave and photoelectron study of *cis*- and *trans*-isocyanato ethene, $\text{CH}_2=\text{CHNCO}$ (vinyl isocyanate), *J. Mol. Spectrosc.* **70**, 216 (1978).
- [5543] Akopyan, M. E., Vilesov, F. I., and Loginov, Y. V. Photoionization of amines and the monomolecular decomposition of excited molecular ions, *Khim. Vys. Energ.* **9**, 327 (1975).
- [5544] Livett, M. K., Nagy-Felsobuki, E., Peel, J. B., and Willett, G. D. Photoelectron spectra of chloramine and dichloramine, *Inorg. Chem.* **17**, 1608 (1978).
- [5545] de Jong, A. P., and Van Dam, H. Ultraviolet photoelectron spectroscopy of cyclic amidines. 2. Electronic structure of clonidine and some related 2-(phenylimino)imidazolidines with α -adrenergic activity, *J. Med. Chem.* **23**, 889 (1980).
- [5546] Barlos, K., and Nöth, H. Beiträge zur Chemie des Bors, CVIII[1] Synthese und Konformation von N,N'-Bis(boryl)-N,N'-dimethylhydrazinen, *Z. Naturforsch.* **35b**, 125 (1980).
- [5547] Mingos, D. M. P. Theoretical and structural studies on organometallic cluster molecules, *Pure Appl. Chem.* **52**, 705 (1980).
- [5548] Dreckschmidt, R., Kessel, H., and Marschner, F. Korrelation zwischen Photoelektronen- und Elektronen-Spektren—VI, *Tetrahedron* **33**, 101 (1977).
- [5549] Meeks, J. L., and McGlynn, S. P. Photoelectron spectra of carbonyls. Oxalyl chloride, ethyl oxalyl chloride, ethyl oxamate and N,N-dimethyl ethyl oxamate, *Spectrosc. Lett.* **8**, 439 (1975).
- [5550] Schweig, A., Weidner, U., and Manuel, G. Photoelektronen-Spektroskopie und transannulare Wechselwirkungen – Zur Frage transannularer d- π -Wechselwirkung in 1-Sila- und 1-Germa-3- cyclopenten, *Angew. Chem.* **84**, 899 (1972).
- [5551] Green, J. C., Powell, P., and Van Tilborg, J. He(I) photoelectron spectra of tricarbonyl-iron and -ruthenium complexes of cyclic dienes, and of tricarbonylcycloheptatriene- and tricarbonylcyclo-octatetraene-iron, *J. Chem. Soc. Dalton* 1974, (1976).
- [5552] Potapov, V. K., Kardash, I. E., Sorokin, V. V., Sokolov, S. A., and Evlasheva, T. I. Photoionization of heteroaromatic compounds, *Khim. Vys. Energ.* **6**, 392 (1972).
- [5553] Beltram, G. A., and Fehlner, T. P. Substituent effects in cluster species. 2. Photoelectron spectra of 2- and 2,4-substituted 1,6-dicarba- *closo*-hexaborane(6) *J. Am. Chem. Soc.* **101**, 6237 (1979).
- [5554] Syrvatka, B. G., Gil'burd, M. M., and Bel'ferman, A. L. Ion-dissociative processes of some halogen- containing butadienes and particles structure, *Zh. Org. Khim.* **9**, 1117 (1973).
- [5555] Verkin, B. I., Sukodub, L. F., and Yanson, I. K. Ionization potentials of nitrogenous bases of nucleic acids, *Dokl. Akad. Nauk SSSR* **228**, 1452 (1976).
- [5556] Rang, S., Paldoia, P., and Talvari, A. Ionization potentials of unsaturated hydrocarbons. 2. Mono- substituted cyclopenten and cyclohexenes, *Eesti NSV Teaduste Akad. Toimetised* 354 (1974).
- [5557] Ponomarev, D. A., Takhimova, V. V., Akopyan, M. E., and Sergeyev, Y. L. Effect of alkyl groups on the stability of cations in the absence of solvation effects, *Zh. Org. Khim.* **10**, 403 (1974).
- [5558] Dougherty, D., and McGlynn, S. P. Photoelectron spectroscopy of carbonyls. 1,4-Benzoquinones, *J. Am. Chem. Soc.* **99**, 3234 (1977).
- [5559] Flamini, A., Semprini, E., Stefani, F., Cardaci, G., Bellachioma, G., and Andreocci, M. He(I) photoelectron spectra of tetracarbonyliron complexes of group 5 ligands and of olefinic ligands, *J. Chem. Soc. Dalton* 695 (1978).
- [5560] Fragala, I., Marks, T. J., Fagan, P. J., and Manriquez, J. M. He(I)- and He(II)- excited photoelectron spectra of bis(pentamethylcyclopentadienyl)zirconiumdichloride, *J. Electron Spectrosc. Relat. Phenom.* **20**, 249 (1980).
- [5561] Efraty, A., and Huang, M. H. A. Mass spectra of organometallic compounds. 8. Electron-impact study of the cyclopentadienylmanganese derivatives $\text{RC}_5\text{H}_4\text{Mn}(\text{CS})(\text{NO})\text{I}$ ($\text{R}=\text{H}, \text{CH}_3$) *Inorg. Chem.* **19**, 2296 (1980).
- [5562] Borden, W. T., Young, S. D., Frost, D. C., Westwood, N. P. C., and Jorgensen, W. L. Photoelectron spectra of the 1,2,5,6-tetramethyl-3,4,7,8-tetramethylene derivatives of tricyclo[3.3.0.0^{2,4}] octane and tricyclo[4.2.0.0^{2,5}] octane, *J. Org. Chem.* **44**, 737 (1979).
- [5563] Gleiter, R., Schang, P., Adam, W., Eggelte, H. J., Erden, I., and Bloodworth, A. J. Photoelectron spectra of bicyclic peroxides, *J. Electron Spectrosc. Relat. Phenom.* **19**, 223 (1980).
- [5564] Torroni, S., Innorta, G., Foffani, A., and Distefano, G. Interpretation of the mass spectra of substituted chromium and tungsten carbonyls by means of

- appearance potential measurements, *J. Organometall. Chem.* **65**, 209 (1974).
- [5565] Barsten, B. E., Cotton, F. A., Green, J. C., Seddon, E. A., and Stanley, G. G. Molecular orbital and spectroscopic studies of triple bonds between transition-metal atoms. 1. The d^1-d^1 Mo_2L_n compounds ($L=OR, NR_2, CH_2R$), *J. Am. Chem. Soc.* **102**, 4579 (1980).
- [5566] Weiner, M. A., Gin, A., and Lattman, M. Ultraviolet photoelectron spectra of 4-substituted pyridine-pentacarbonylchromium complexes, *Inorg. Chim. Acta* **24**, 235 (1977).
- [5567] Anderson III, G. M., Kollman, P. A., Domelsmith, L. N., and Houk, K. N. Methoxy group nonplanarity in *o*-dimethoxybenzenes. Simple predictive models for conformations and rotational barriers in alkoxyaromatics, *J. Am. Chem. Soc.* **101**, 2344 (1979).
- [5568] Fragalà, I., Costanzo, L. L., Ciliberto, E., Condor-elli, G., and D'Arrigo, C. He-I and He-II excited photoelectron spectra of tetracoordinated complexes of transition metal ions with β -diketonate ligands, *Inorg. Chim. Acta* **40**, 15 (1980).
- [5569] Cauletti, C., Nicotra, G., and Piancastelli, M. N. The electronic structure of some alkyl-tin derivatives with sulphur-containing ligands studied by UV photoelectron spectroscopy, *J. Organomet. Chem.* **190**, 147 (1980).
- [5570] Schubert, R., and Grützmacher, H.-F. Kinetic energy release and position of transition state during intramolecular aromatic substitution in ionized 1-phenyl-1-(2-pyridyl)ethylenes, *J. Am. Chem. Soc.* **102**, 5323 (1980).
- [5571] Kochi, J. K. The role of electron transfer and charge transfer in organometallic chemistry, *Pure Appl. Chem.* **52**, 571 (1980).
- [5572] Bock, H., and Wagner, G. "Einsame" Elektronenpaare in organischen Sulfiden und Disulfiden, *Angew. Chem.* **84**, 119 (1972).
- [5574] Bock, H., Kaim, W., and Rohwer, H. E. Die hyperkonjugative Stabilisierung von *p*-Xylol-Radikalkationen durch $(H_3C)_3Si$ -Substituenten, *Chem. Ber.* **111**, 3573 (1978).
- [5575] Kovač, B., Allan, M., Heilbronner, E., Maier, J. P., Gleiter, R., Haenel, M. W., Keehn, P. M., and Reiss, J. A. He(I α) photoelectron spectra of [2.2] cyclophanes, *J. Elect. Spectrosc. Relat. Phenom.* **19**, 167 (1980).
- [5576] Efraty, A., Liebman, D., Huang, M. H. A., and Weston, C. A. Mass spectra of organometallic compounds. 6. Energetics of fragmentations of manganese-containing ions with intact ligands in the series $CH_3C_5H_4Mn(CO)_2L$ and $CH_3C_5H_4Mn(CO)(CS)L$ [$L=Ph_3As$ and Ph_3Sb], *Inorg. Chim. Acta* **39**, 105 (1980).
- [5577] Palmer, M. H., Simpson, I., and Platenkamp, R. J. The electronic structure of flavin derivatives, *J. Mol. Struct.* **66**, 243 (1980).
- [5578] Spanget-Larsen, J., Gleiter, R., Klein, G., Doecke, C. W., and Paquette, L. A. Orbital interactions in "hypostrophene" and its hydro- and homo-derivatives, A photoelectron spectroscopic investigation, *Chem. Ber.* **113**, 2120 (1980).
- [5579] Berry, M., Garner, C. D., Hillier, I. H., MacDowell, A. A., and Clegg, W. Crystal structure and U. V. photoelectron spectra of tetrakis-(6-methyl-2-oxopyridinato)dirhodium, *J. Chem. Soc. Chem. Commun.* 494 (1980).
- [5581] Nelsen, S. F., Kessel, C. R., Brien, D. J., and Weinhold, F. 9-(9-Borabicyclo[3.3.1]nonyl)-9-azabicyclo[3.3.1]nonane radical cation: A failure of Bredt's Rule kinetic stabilization, *J. Org. Chem.* **45**, 2116 (1980).
- [5582] Efraty, A., Liebman, D., Huang, M. H. A., Weston, C. A., and Angelici, R. J. Mass spectra of organometallic compounds. 7. Electron-impact study of some cyclopentadienylmetal thiocarbonyl-bridged dimers, *Inorg. Chem.* **17**, 2831 (1978).
- [5583] Rang, S., and Martinson, E. Ionization potentials of unsaturated hydrocarbons. 3. *n*-Alkynes C_n-C_{11} , *Eesti NSV Teaduste Akadeemia Toimetised* **27**. *Kõide Keemia Geol.* **44** (1978).
- [5584] Rang, S., Martinson, E., and Müürisepp, M. Ionization potentials of unsaturated hydrocarbons. 1. *n*-Alkenes, *Eesti NSV Teaduste Akadeemia Toimetised* **23**. *Kõide Keemia Geol.* **352** (1974).
- [5585] Il'in, M. K., Makarov, A. V., and Nikitin, O. T. A study of evaporating products of barium metaborate, *Vestn. Mosk. Univ., Ser. II: Khim.* **15**, 436 (1974).
- [5586] Shikhmamedbekova, A. Z., Aslanov, F. A., Gadzhiev, M. M., Gulamova, T. E., and Akhmedova, F. N. Mass spectrometric study of methylene cycloalkenes, *Dokl. Akad. Nauk Azerb. SSR* **26**, 34 (1970).
- [5587] Makarov, A. V., Nikitin, O. T., and Chervonny, A. D. The mass-spectrometric study of evaporation of indium metaborate, *Vestn. Mosk. Univ., Ser. II: Khim.* **15**, 193 (1974).
- [5588] Semenov, G. A., Volkov, A. D., and Franktseva, K. E. Mass-spectrometric study of sodium carbonate vaporization, *Tr. Leningrad. Tekhnol. Inst. Tsellyul.-Bum. Prom.* **30**, 153 (1973).
- [5589] Zverev, V. V., Vovna, V. I., Elman, M. S., Kitaev, Y. N., and Vilesov, F. I. Photoelectron spectra and spatial structure of acyclic azines, *Dokl. Akad. Nauk USSR* **213**, 1117 (1973).
- [5590] Armen, G. H., Braunstein, C., Weinstein, M. I., and Baker, A. D. Reaction of azoxyanisole with oxalyl chloride: Use of photoelectron spectroscopy in seeking new reactions, *Tetrahedron Letters* 4197 (1979).
- [5591] Kokars, V., Kampars, V., and Neilands, O. Characteristics of π -electron structure of betainelike active methylene group derivatives. VII. Electron absorption spectra and electron-donor properties of the series of β -diketone onium betaines, *Latv. Psr. Zinat. Akad. Vestis Kim. Ser.* **6**, 734 (1975).
- [5592] Kampars, V., and Neilands, O. Characteristics of π -electron structure of betainelike active methylene group derivatives. VI. Character of long-wave absorption bands and charge transfer complexes of 1,3-indanodine onium betaines, *Latv. Psr. Zinat. Akad. Vestis Kim. Ser.* **6**, 727 (1975).
- [5593] Kreicberga, Y. N., Kampars, V., and Neilands, O. Y. Onium derivatives of tetraarylcyclopentadienes, *Zh. Org. Khim.* **11**, 1508 (1975).
- [5594] Yu, C., Peng, S., Akiyama, I., Lin, J., and LeBreton, P. R. Ultraviolet photoelectron studies of biological pyrimidines. The valence electronic structure of cytosine, *J. Am. Chem. Soc.* **100**, 2303 (1978).
- [5595] Carnovale, F., Gan, T. H., Peel, J. B., and Franz, K.-D. The photoelectron spectra of some 1,9-disubstituted phenalenes, *J. Chem. Soc. Perkin II*, 957 (1980).
- [5596] Garner, C. D., Hillier, I. H., Knight, M. J., MacDowell, A. A., Walton, I. B., and Guest, M. F. Electronic structure and assignment of the ultraviolet photoelectron spectra of 6-methyl-2-oxo-pyridine complexes of dichromium(II) and dimolybdenum(II), *J. Chem. Soc. Faraday II* **76**, 885 (1980).
- [5597] Gleiter, R., Haider, R., Murata, I., and Pagni, R. M. Photoelectron spectra of three isomeric $(C_{11}H_{10})$ naphtho[1,8]-fused hydrocarbons, *J. Chem. Res. (S)*, 72 (1979).
- [5598] Zaikin, V. G., and Wulfson, N. S. Ionization and appearance potentials in organic chemistry, *Org. Mass Spectrom.* **13**, 680 (1978).
- [5599] Paquette, L. A., Bellamy, F., Böhm, M. C., and Gleiter, R. Electronic control of stereoselectivity. 6. Directionality of singlet oxygen addition to 1,4-dimethoxynaphthalenes

- laterally fused to bridged bicyclic systems, *J. Org. Chem.* **45**, 4913 (1980).
- [5600] Kovač, B., Mohraz, M., Heilbronner, E., Boekelheide, V., and Hopf, H. Photoelectron spectra of the cyclophanes, *J. Am. Chem. Soc.* **102**, 4314 (1980).
- [5601] Lappert, M. F., McCabe, R. W., MacQuitty, J. J., Pye, P. L., and Riley, P. I. Paramagnetic carbenometal complexes. Part I. Cationic chromium(I) complexes and the chemistry of their chromium(0) precursors and of related molybdenum(0) and tungsten(0) complexes, especially with bulky carbene ligands $C(OR')R[R=CH(SiMe_3)_2]$ or CH_2SiMe_3 , *J. Chem. Soc. Dalton* **90** (1980).
- [5602] Yarbrough II, L. W., and Hall, M. B. Photoelectron spectra of substituted chromium, molybdenum, and tungsten pentacarbonyls. Relative π -acceptor and σ -donor properties of various phosphorus ligands, *Inorg. Chem.* **17**, 2269 (1978).
- [5603] Ratkovskii, I. A., and Butlin, B. A. Appearance potential of ions in the mass spectrum of $LaPO_4$, *Vest. Akad. Nauk* **5**, 115 (1973).
- [5604] Bischof, P., Gleiter, R., Dach, R., Enders, D., and Seebach, D. Zur Wechselwirkung einsamer Elektronenpaare in Δ^2 Tetrazenen. Photoelektronenspektroskopische Untersuchungen, *Tetrahedron* **31**, 1415 (1975).
- [5605] Bruckmann, P., and Klessinger, M. Photoelektronenspektren ungesättigter Systeme mit Cyclopropan- und Cyclobutanringen, *Angew. Chem.* **84**, 543 (1972).
- [5606] Bischof, P., Bosse, D., Gleiter, R., Kukla, M. J., de Meijere, A., and Paquette, L. A. Zur Frage der Homokonjugation in Triquinacen und 2a,4a,8a,8b-Tetrahydrocyclopent[cd]azulen. Photoelektronenspektroskopische Untersuchungen, *Chem. Ber.* **108**, 1218 (1975).
- [5607] Bruckmann, P., and Klessinger, M. Konjugative Wechselwirkungen des Cyclobutans, *Chem. Ber.* **111**, 944 (1978).
- [5608] Bouchoux, G. Ionisation et fragmentation en spectrométrie de masse VIII. Énergies d'activation de deux fragmentations compétitives, dissociation de l'acétate de phényle et de l'acetanilide sous impact électronique, *Int. J. Mass Spectrom. Ion Phys.* **26**, 379 (1978).
- [5609] Bock, H., and Fuss, W. Notiz zu Ionisierungsenergien und Geometrie von Aminoboranen, *Chem. Ber.* **109**, 799 (1976).
- [5610] Bock, H., Hirabayashi, T., Mohmand, S., and Solouki, B. Instabile Zwischenprodukte in der Gasphase: Der thermische Zerfall von Carbonsäurechloriden $RCOCl$, *Angew. Chem.* **89**, 106 (1977).
- [5611] Bouchoux, G. Ionisation et fragmentation en spectrométrie de masse, *Org. Mass Spectrom.* **13**, 184 (1978).
- [5612] Bock, H., and Brähler, G. Oxidation und Reduktion methylthio-substituierter π -Systeme und die Elektronenverteilung in ihren Radikationen, *Angew. Chem.* **89**, 893 (1977).
- [5613] Bischof, P., Gleiter, R., Hafner, K., Knauer, K. H., Spanget-Larsen, J., and Süss, H. U. Das Photoelektronen- und Elektronenspektrum des 1,3,5-Tri-*tert*-butylpentalens. Hinweis auf Bindungsalternanz im Grundzustand, *Chem. Ber.* **111**, 932 (1978).
- [5614] Klasinc, L., Trinajstić, N., and Knop, J. V. Application of photoelectron spectroscopy to biologically active molecules and their constituent parts. VIII. Thalidomide, *Int. J. Quantum Chem.* **7**, 403 (1980).
- [5615] Stockbauer, R., and Inghram, M. G. The fragmentation of propane and deuteropropane molecular ions, *J. Chem. Phys.* **65**, 4081 (1976).
- [5616] Williamson, A. D., and Beauchamp, J. L. Ion molecule reactions in vinyl fluoride by photoionization. Effects of vibrational excitation on major reaction pathways, *J. Chem. Phys.* **65**, 3196 (1976).
- [5617] Smyth, K. C., Schiavone, J. A., and Freund, R. S. Dissociative excitation of N_2 by electron impact: Translational spectroscopy of long-lived high- Rydberg fragment atoms, *J. Chem. Phys.* **59**, 5225 (1973).
- [5618] Schäfer, W., Schweig, A., and Mathey, F. Phospholes. Electronic structure, *J. Am. Chem. Soc.* **98**, 407 (1976).
- [5619] Rušćić, B., Kovač, B., Klasinc, L., and Güsten, H. Photoelectron spectroscopy of heterocycles. Fluorene analogues, *Z. Naturforsch.* **33a**, 1006 (1978).
- [5620] Dudin, A. V., Gorokhov, L. N., and Baluev, A. V. A study of the electron-impact ionization of chlorine trifluoride and its decomposition products by mass spectrometry, *Izvest. Akad. Nauk SSSR, Ser. Khim.* **2408** (1979).
- [5621] Andrews, G. D., Baldwin, J. E., and Gilbert, K. E. Photoelectron spectrum of bicyclo[2.1.0]pent-2-ene: Electronic destabilization of a homo[4n] annulene, *J. Org. Chem.* **45**, 1523 (1980).
- [5622] Engler, E. M., Kaufman, F. B., Green, D. C., Klotz, C. E., and Compton, R. N. Ionization potentials and donor properties of selenium analogs of tetrathiafulvalene, *J. Am. Chem. Soc.* **97**, 2921 (1975).
- [5623] Hamada, Y., Hirakawa, A. Y., Tsuboi, M., and Ogata, H. Interaction between lone pair electrons on the nitrogen atoms in 1,5-diazabicyclo[3.2.1]octane, *Bull. Chem. Soc. Japan* **46**, 2244 (1973).
- [5624] Vovna, V. I., Lopatin, S. N., Pettsol'd, R., and Vilesov, F. I. Photoelectron spectra and electronic structure of some phosphoryl compounds, *Khim. Vys. Energ.* **9**, 9 (1975).
- [5625] Pasto, D. J., Fehlner, T. P., Schwartz, M. E., and Baney, H. F. On the orbital interactions of three-membered rings with π systems. Electronic structure of alkenylidenecyclopropanes, *J. Am. Chem. Soc.* **98**, 530 (1976).
- [5626] Botter, R., and Carlier, J. Spectre de photoélectrons et calcul des facteurs de Franck-Condon pour H_2O , D_2O , HDO , *J. Electron Spectrosc. Relat. Phenom.* **12**, 55 (1977).
- [5627] Zverev, V. V., Vilesov, F. I., Vovna, V. I., Lopatin, S. N., and Kitaev, Y. P. Photoelectron spectra, *Izv. Akad. Nauk. SSSR, Ser. Khim.* **1975**, 1051 (1975).
- [5628] Barlos, K., and Nöth, H. Beiträge zur Chemie des Bors, CVIII. Synthese und Konformation von N,N' -Bis(boryl)- N,N' -dimethylhydrazinen, *Z. Naturforsch.* **35b**, 125 (1980).
- [5629] Bock, H., and Kaim, W. Einelektronen-Oxidationen $(H_3C)_3SiCH_2$ -substituierter benzole in der gasphase und in Lösung, *Chem. Ber.* **111**, 3552 (1978).
- [5630] Schäfer, W., Schweig, A., Bickelhaupt, F., and Vermeer, H. Photoelectron spectroscopy and conjugation: direct proof of the unusual sequence of the two highest occupied π -molecular orbitals in the phosphorin (phosphabenzene) and the arsenin (arsabenzene) system, *Angew. Chem. Intern. Ed.* **11**, 924 (1972).
- [5631] Turk, J., and Shapiro, R. H. Formation of benzoyl ions: a complicated cleavage reaction, *Org. Mass Spectrom.* **6**, 189 (1972).
- [5632] Bock, H., and Wagner, G. "Electron lone pairs" in organic sulfides and disulfides, *Angew. Chem. Intern. Ed.* **11**, 150 (1972).
- [5633] Tomer, K. B., Turk, J., and Shapiro, R. H. Anchimeric assistance in electron-impact reactions: homoallylic systems, *Org. Mass Spectrom.* **6**, 235 (1972).
- [5634] Guido, M., Gigli, G., and Balducci, G. Dissociation energy of $CuCl$ and Cu_2Cl_2 gaseous molecules, *J. Chem. Phys.* **57**, 3731 (1972).
- [5635] Cocke, D. L., and Gingerich, K. A. Determination of the heats of atomization of the molecules RhC_2 , RhC , and TiC_2 by high temperature mass spectrometry, *J. Chem. Phys.* **57**, 3654 (1972).

U.S. DEPT. OF COMM. BIBLIOGRAPHIC DATA SHEET (See instructions)		1. PUBLICATION OR REPORT NO. NSRDS-NBS 71	2. Performing Organ. Report No.	3. Publication Date October 1982
4. TITLE AND SUBTITLE Ionization Potential and Appearance Potential Measurements, 1971-1981				
5. AUTHOR(S) Rhoda D. Levin and Sharon G. Lias				
6. PERFORMING ORGANIZATION (If joint or other than NBS, see instructions) NATIONAL BUREAU OF STANDARDS DEPARTMENT OF COMMERCE WASHINGTON, D.C. 20234			7. Contract/Grant No. EA-77-A-01-6010	
			8. Type of Report & Period Covered Final	
9. SPONSORING ORGANIZATION NAME AND COMPLETE ADDRESS (Street, City, State, ZIP) Office of Standard Reference Data, National Bureau of Standards, Washington, DC 20234 and U. S. Department of Energy, Pollutant Characterization and Safety Research Division, Washington, DC 20545				
10. SUPPLEMENTARY NOTES Library of Congress Catalog Card Number: 82-2095 <input type="checkbox"/> Document describes a computer program; SF-185, FIPS Software Summary, is attached.				
11. ABSTRACT (A 200-word or less factual summary of most significant information. If document includes a significant bibliography or literature survey, mention it here) A compilation is presented of the ionization potential and appearance potential measurements which appeared in the refereed literature in the time period 1971-1981. The data are sorted according to the identity of the ionic species formed in the ionization process. Precursor molecules or radicals are identified by a structural formula and, in the case of compounds containing rings, by name according to the Chemical Abstracts system of nomenclature. Chemical Abstracts Registry Numbers are provided where available. A complete bibliography and author index are provided.				
12. KEY WORDS (Six to twelve entries; alphabetical order; capitalize only proper names; and separate key words by semicolons) appearance potential; charge transfer spectrum; electron impact ionization; ionization potential; photoelectron spectroscopy; photoionization; spectroscopy				
13. AVAILABILITY <input checked="" type="checkbox"/> Unlimited <input type="checkbox"/> For Official Distribution. Do Not Release to NTIS <input checked="" type="checkbox"/> Order From Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. <input type="checkbox"/> Order From National Technical Information Service (NTIS), Springfield, VA. 22161			14. NO. OF PRINTED PAGES 634	
			15. Price \$12.00	

**Announcement of New Publications in
National Standard Reference Data Series**

Superintendent of Documents,
Government Printing Office,
Washington, D.C. 20402

Dear Sir:

Please add my name to the announcement list of new publications to be issued in the series: National Standard Reference Data Series—National Bureau of Standards.

Name_____

Company_____

Address_____

City_____State_____Zip Code_____

(Notification Key N-519)

NBS TECHNICAL PUBLICATIONS

PERIODICALS

JOURNAL OF RESEARCH—The Journal of Research of the National Bureau of Standards reports NBS research and development in those disciplines of the physical and engineering sciences in which the Bureau is active. These include physics, chemistry, engineering, mathematics, and computer sciences. Papers cover a broad range of subjects, with major emphasis on measurement methodology and the basic technology underlying standardization. Also included from time to time are survey articles on topics closely related to the Bureau's technical and scientific programs. As a special service to subscribers each issue contains complete citations to all recent Bureau publications in both NBS and non-NBS media. Issued six times a year. Annual subscription: domestic \$18; foreign \$22.50. Single copy, \$4.25 domestic; \$5.35 foreign.

NONPERIODICALS

Monographs—Major contributions to the technical literature on various subjects related to the Bureau's scientific and technical activities.

Handbooks—Recommended codes of engineering and industrial practice (including safety codes) developed in cooperation with interested industries, professional organizations, and regulatory bodies.

Special Publications—Include proceedings of conferences sponsored by NBS, NBS annual reports, and other special publications appropriate to this grouping such as wall charts, pocket cards, and bibliographies.

Applied Mathematics Series—Mathematical tables, manuals, and studies of special interest to physicists, engineers, chemists, biologists, mathematicians, computer programmers, and others engaged in scientific and technical work.

National Standard Reference Data Series—Provides quantitative data on the physical and chemical properties of materials, compiled from the world's literature and critically evaluated. Developed under a worldwide program coordinated by NBS under the authority of the National Standard Data Act (Public Law 90-396).

NOTE: The principal publication outlet for the foregoing data is the Journal of Physical and Chemical Reference Data (JPCRD) published quarterly for NBS by the American Chemical Society (ACS) and the American Institute of Physics (AIP). Subscriptions, reprints, and supplements available from ACS, 1155 Sixteenth St., NW, Washington, DC 20056.

Building Science Series—Disseminates technical information developed at the Bureau on building materials, components, systems, and whole structures. The series presents research results, test methods, and performance criteria related to the structural and environmental functions and the durability and safety characteristics of building elements and systems.

Technical Notes—Studies or reports which are complete in themselves but restrictive in their treatment of a subject. Analogous to monographs but not so comprehensive in scope or definitive in treatment of the subject area. Often serve as a vehicle for final reports of work performed at NBS under the sponsorship of other government agencies.

Voluntary Product Standards—Developed under procedures published by the Department of Commerce in Part 10, Title 15, of the Code of Federal Regulations. The standards establish nationally recognized requirements for products, and provide all concerned interests with a basis for common understanding of the characteristics of the products. NBS administers this program as a supplement to the activities of the private sector standardizing organizations.

Consumer Information Series—Practical information, based on NBS research and experience, covering areas of interest to the consumer. Easily understandable language and illustrations provide useful background knowledge for shopping in today's technological marketplace.

Order the above NBS publications from: Superintendent of Documents, Government Printing Office, Washington, DC 20402.

Order the following NBS publications—FIPS and NBSIR's—from the National Technical Information Services, Springfield, VA 22161.

Federal Information Processing Standards Publications (FIPS PUB)—Publications in this series collectively constitute the Federal Information Processing Standards Register. The Register serves as the official source of information in the Federal Government regarding standards issued by NBS pursuant to the Federal Property and Administrative Services Act of 1949 as amended, Public Law 89-306 (79 Stat. 1127), and as implemented by Executive Order 11717 (38 FR 12315, dated May 11, 1973) and Part 6 of Title 15 CFR (Code of Federal Regulations).

NBS Interagency Reports (NBSIR)—A special series of interim or final reports on work performed by NBS for outside sponsors (both government and non-government). In general, initial distribution is handled by the sponsor; public distribution is by the National Technical Information Services, Springfield, VA 22161, in paper copy or microfiche form.

U.S. Department of Commerce
National Bureau of Standards

Washington, D.C. 20234
Official Business

Penalty for Private Use \$300



POSTAGE AND FEES PAID
U S DEPARTMENT OF COMMERCE
COM-215

SPECIAL FOURTH-CLASS RATE
BOOK